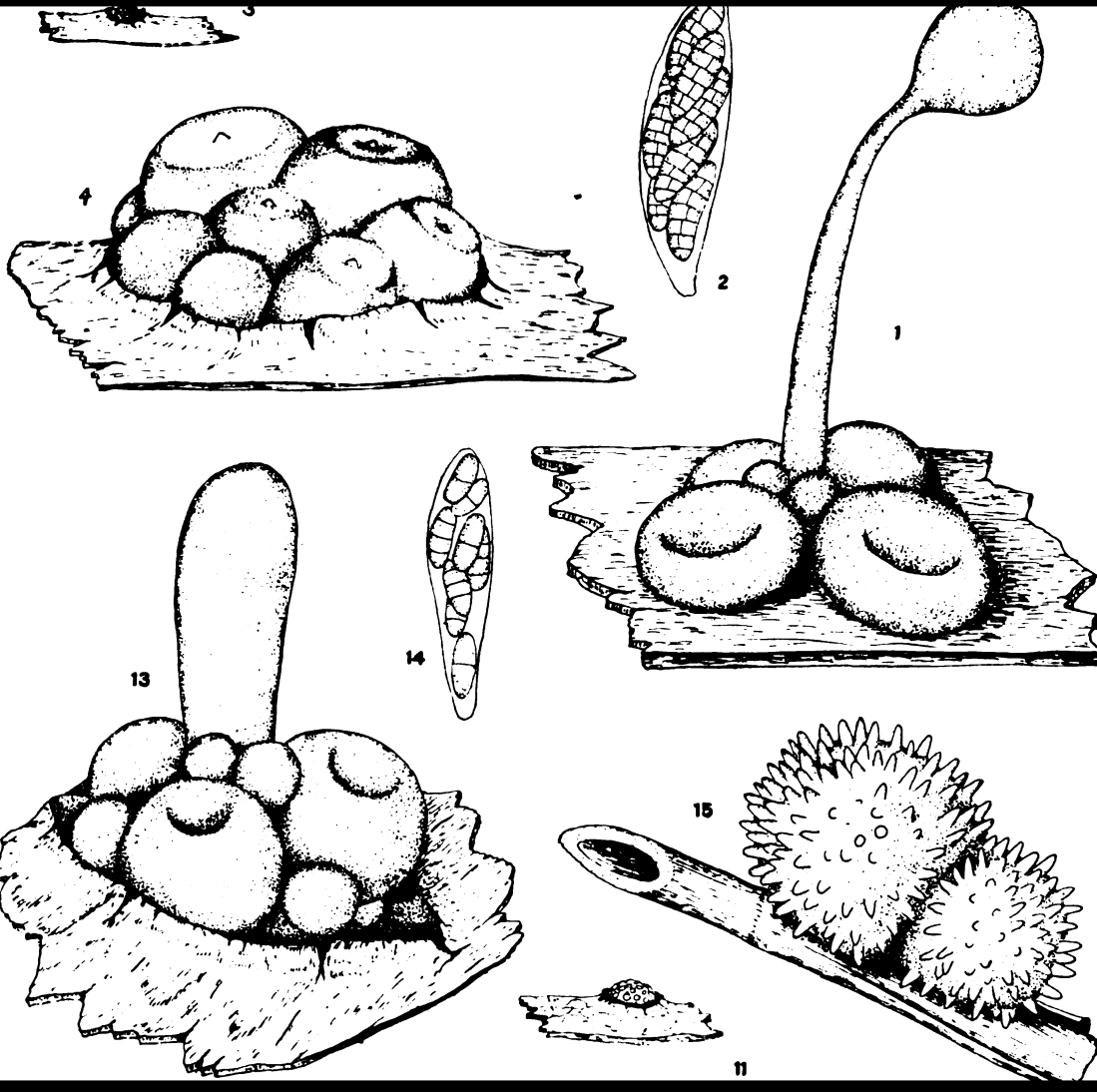

The Hypocreales of North America

Fred Jay Seaver

THE HYPOCREALES OF NORTH AMERICA

By

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A THESIS

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PREFACE

The work of this monograph was begun during the autumn of 1906, its object being to give a better understanding of the North American species of the order treated.

The work is based largely on the collections of fungi in the New York Botanical Garden, including the extensive Ellis collections. Other herbaria which have been visited for the purpose of study during the course of the work are the Schweinitz collection in Philadelphia, the collections of Dr. C. H. Peck in the State Museum at Albany, and those of the United States Department of Agriculture, Washington, D. C. In addition to these, I have been permitted to examine the fungi of this group from the herbarium of the late A. P. Morgan, of Ohio, which collection is now in the State University of Iowa, and have also examined numerous types from the Royal Gardens, Kew, England.

In the preparation of this work, I wish to acknowledge my indebtedness to Dr. N. L. Britton, Dr. W. A. Murrill, and other members of the staff of the New York Botanical Garden, also to Professor T. H. Macbride of the State University of Iowa and to the late Professor L. M. Underwood, of Columbia University. The names of other persons who have contributed to the completion of the work appear on the following pages.

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THE HYPOCREALES OF NORTH AMERICA—I

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(WITH PLATES 4 AND 5, CONTAINING 33 FIGURES)

The Hypocreales might be briefly defined as the bright-colored sphaeriaceous fungi, the bright color being the most conspicuous character of this order, the early described members of which were included in the genus *Sphaeria*. In addition to color, the plants of the order are characterized by membranaceous perithecia and fleshy stromata, when the latter are present, as opposed to the carbonaceous perithecia and stromata and, usually, the black color of the true pyrenomycetes. While no one of these characters is sufficient in itself, taken together they are quite definitive of the order, which appears to be a well-marked natural group.

The plants of this order exhibit in their life-histories two phases, the conidial and ascigerous, the so-called imperfect fungi representing the conidial phase of many of the species. In no group of fungi is there more need of a close and critical study of the life-histories of its individual members than in the one now under consideration. In a few cases this has been done, with the result that some of the species have been found to be of extreme economic importance in their relation to plant diseases, and doubtless the same fact will be discovered with reference to other species when critical work of this kind is extended to those forms. While the conidial phase in a part of the order is obscure, in others it is often profuse, forming a distinct fleshy or cottony stroma, on which are produced first conidiophores and conidia, and later perithecia, the latter containing the asci and spores. The characters of the conidiophores and conidia are very variable and will furnish much valuable information as to the natural relationship of the various members when the life-histories of the species are better known. In one group, which is here treated as a tribe, the stromata develop from a sclerotium, the latter term

being used in its broader sense to include any fungous growth which produces its ascigerous stage only after a period of rest.

The order contains approximately two hundred species in the region covered in the present work, which are distributed throughout temperate and tropical America. While many species occur throughout North America, others are found only in the tropics.

The classification of the order is a question concerning which there are many different views. A single family is usually recognized, and this is divided by Lindau* into six subfamilies. The system adopted in the present monograph corresponds in many respects with that proposed by Lindau, but differs in that perithecial and stromatic characters are considered of primary importance in the separation of the order into families and tribes, while spore characters (color, form, septation, etc.) are retained as of generic or specific importance only.

The genus *Nectria* as commonly considered includes both stromatic and non-stromatic species. This difference was recognized by Fries, and has continued to be recognized as a sectional or subgeneric character up to the present time. Dr. M. C. Cooke went a step further and raised Saccardo's subgenus *Dialonectria* to generic rank, although this is not commonly so recognized. The separation of this genus on the presence or absence of a stroma is here maintained, but since the type of the genus *Nectria* falls among the non-stromatic species, the name *Nectria* is retained for those forms, while a new name is proposed for the stromatic species. In recent times, other genera, such as *Ophionectria* with filiform spores and *Calonectria* with many-septate spores, have been segregated from the old genus and a separation of *Nectria* on the presence or absence of a stroma necessitates a similar separation of other genera in which stromatic and non-stromatic species have been associated. The free (non-stromatic) forms of nectriaceous plants are here brought together in the tribe Nectrieae.

With the stromatic and perithecial characters as a basis, the order consists of two well-defined groups, which are here treated as families, each of which is in turn divided into two tribes. The details of this classification are contained in the synopsis given below.

* E. & P. Nat. Pfl. 1¹: 346. 1897.

Order HYPOCREALES

Perithecia globose, ovate, conical, cylindrical, fusoid, or flask-shaped, free on the substratum (occasionally subepidermal) or united by a common matrix, varying from a cottony subiculum to a distinct fleshy stroma, bright-colored, white, yellow, red, brown, violet, but never entirely black, except in extreme age, opening by an ostiolum; perithecial wall membranaceous or submembranaceous, never carbonaceous; stroma when present bright-colored and soft, fleshy or cottony, and varying in size from 1–2 mm. to several cm. in diameter, patellate or effused, with the perithecia entirely superficial or partially to entirely immersed; asci cylindrical, clavate, or subovoid, mostly 4–8-spored but often becoming 16-spored by the separation of each original spore into 2 globose or subglobose cells; spores simple or compound, hyaline or colored, globose to filiform.

Conidiophores and conidia very variable.

Stroma wanting, or when present, with the perithecia entirely superficial, usually in cespitose clusters. 1. NECTRIACEAE.

Stroma or stromatic base always present and forming a conspicuous matrix in which the perithecia are partially to entirely immersed, rarely subsuperficial especially in aged specimens. 2. HYPOCREACEAE.

Family 1. NECTRIACEAE

Perithecia entirely free on the substratum (occasionally subepidermal), or seated on a fleshy or tubercular stroma, but when the latter is present, perithecia always superficial, usually in cespitose clusters; stroma often obscured at maturity by the perithecia and occasionally becoming obsolete in aged specimens, but in such cases its presence is indicated by the densely cespitose clusters of perithecia.

Stroma and stromatic base entirely wanting; perithecia free on the substratum, scattered or crowded, occasionally subepidermal. 1. NECTRIEAE.

Stroma or stromatic base always present; but often obscured at maturity by the perithecia and occasionally disappearing in weathered specimens but its presence indicated by the densely cespitose clusters of perithecia. 2. CREONECTRIEAE.

Tribe 1. NECTRIEAE

Perithecia free (without stroma) and occurring singly but often gregarious and occasionally more or less crowded on the surface of the substratum, or formed beneath the epidermis and becoming erumpent-superficial, smooth, verrucose, or clothed with deciduous mycelial threads or well-developed hairs; asci cylindrical to clavate or subovoid, 4–8-spored; spores simple or compound, globose to filiform, hyaline or colored; conidial phase never forming a stroma.

Spores hyaline.	
Perithecia subepidermal, becoming erumpent-superficial.	
Spores simple.	1. HYPONECTRIA.
Spores septate.	2. NECTRIELLA.
Perithecia superficial on the substratum.	
Spores simple.	
Spores appendiculate; perithecia beaked.	3. ELEUTHROMYCES.
Spores without appendages; perithecia not beaked.	4. PSEUDONECTRIA.
Spores compound, 1–many-septate.	
Spores 1-septate.	5. NECTRIA.
Spores more than 1-septate.	
Perithecia light-colored, yellow or red.	
Spores elliptical to fusiform.	6. CALONECTRIA.
Spores filiform or subfiliform.	7. OPHIONECTRIA.
Perithecia dark-colored, blue.	8. GIBBERELLA.*
Spores dark-colored, brown or blackish.	
Spores simple.	
Spores subglobose, rough; perithecia subglobose.	9. NEOCOSMOSPORA.
Spores elliptical, smooth; perithecia flask-shaped.	10. MELANOSPORA.
Spores compound, 1-septate.	11. LETENDRAEA.

1. HYPONECTRIA Sacc. Michelia 1: 250. 1878

Perithecia globose or subglobose, subepidermal, often becoming erumpent; asci 8-spored; spores elliptical or subelliptical, hyaline, simple. Distinguished from *Nectriella* by the simple spores.

Type species: *Sphaeria Buxi* DC.

Spores 5–6 × 1.5–2 mic., on stems of *Opuntia* sp.	1. *H. Cacti.*
Spores 10 × 2–2.5 mic., on herbaceous stems.	2. *H. dakotensis.*

* See Creonectrieae.

1. HYPONECTRIA CACTI (Ellis & Everh.) Seaver, Mycologia 1: 20. 1909

Nectriella Cacti Ellis & Everh. Jour. Myc. 8: 66. 1902.

Perithecia minute, scattered, subepidermal, globose or subglobose, expanded above the epidermis into a disc-like ostiolum; perithecia red, with the ostiolum lighter, whitish (in preserved specimens), about 200 mic. in diameter; asci cylindrical or clavate, 8-spored, 40–50 × 3–4 mic.; spores 2-seriate, simple, hyaline, straight or curved, 5–6 × 1.5–2 mic.

On stems of *Opuntia* sp.

TYPE LOCALITY: Alabama.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Alabama, *Carver 584* (type).

2. HYPONECTRIA DAKOTENSIS Seaver, Mycologia 1: 20. 1909

Perithecia scattered or occasionally 2 or more in close contact, subepidermal, becoming more or less erumpent, long covered by the thin, whitish epidermis of the host, scattered over whitish patches on the substratum but with no apparent superficial mycelial growth; ostiolum forming a disc-like expansion above the surface of the epidermis with a distinct perforation in the center, slightly hairy, especially near the margin of the disc where the hairs appear as a delicate fringe; perithecia 200 mic. in diameter; asci clavate, 8-spored, 30–45 × 5 mic.; spores mostly 2-seriate above, often 1-seriate below, fusoid, with usually 2 large oil-drops, and 1–2 smaller ones toward either end, 10 × 2–2.5 mic.; paraphyses present, delicate (*pl. 4. f. 5*).

On herbaceous stems (*Ambrosia trifida*?).

TYPE LOCALITY: Fargo, N. Dakota.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Mycologia 1: *pl. 2. f. 1–4.*

2. NECTRIELLA Fuckel, Symb. Myc. 175. 1869

Charonectria Sacc. Michelia 2: 72. 1880.

Perithecia globose or subglobose, entirely subepidermal or erumpent-superficial; asci 8-spored; spores hyaline, 1-septate.

Type species: *Nectriella Fuckelii* Nitsch.

Distinguished from *Hyponectria* by the compound spores.

Perithecia large, 400 mic. in diameter, pale red.	1. *N. Pedicularis.*
Perithecia small, 175–200 mic. in diameter, scarlet.	2. *N. peponum.*

1. **Nectriella Pedicularis** (Tracy & Earle)

Charonectria Pedicularis Tracy & Earle, Plantae Bakeriannae 1: 26. 1901.

Scattered or gregarious, perithecia prominent but long covered by the thin epidermis, orbicular, at length subdepressed, bright-coral-red, smooth, soft, perforated by an obscure ostiolum, 400 mic. in diameter; asci numerous, cylindrical, with a stem-like base, 100 × 8 mic.; spores obliquely 1-seriate, hyaline, minutely granular within, 1-septate, subelliptical, ends acutish, 17 × 4 mic.

On dead stems of *Pedicularis crenulata.*

TYPE LOCALITY: Colorado.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Colorado, *Baker & Earle 230* (type).

The species is distinct in the large perithecia and spores.

2. **Nectriella peponum** (Berk. & Curt.)

Nectria peponum Berk. & Curt. Grevillea 4: 16. 1875.

Nectria perpusilla Berk. & Curt.; Ravenel, Fungi Car. Exsicc. 51.

Perithecia scattered or gregarious, at first covered by the thin epidermis, becoming subsuperficial, but nestling in minute cavities in the substratum; ovoid, with a prominent, obtuse ostiolum, 175 × 200 mic., bright red, nearly scarlet, component cells of the perithecial wall distinct, 5 mic. in diameter; asci clavate, 35–40 × 5–6 mic., 8-spored; spores 1-septate, fusoid, hyaline, 10 × 4 mic.

On dead gourds.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: North Carolina, South Carolina.

EXSICCATI: Ravenel, Fungi Am. Exsicc. *338* and Fungi Car. Exsicc. *51.*

The species very closely resembles *Nectria sanguinea* (Bolton) Fries, but differs in its habitat and subhypodermal character, as well as in the color of the perithecia.

DOUBTFUL SPECIES

Nectria Galii Plow. & Hark. Bull. Cal. Acad. Sci. 1: 26. 1884.

"Perithecia scattered, immersed then erumpent, obtuse, pale red; asci cylindrical, very delicate, mic. 60 × 5–8, sporidia eight, uniseriate, pale straw-colored, oblong-oval, with bluntly-pointed ends, mic. 10 × 5 on *Galium trifolium.*"

"Mr. Phillips figures the sporidia as being uniseptate. I was unable to make out any septum, but the specimens examined may have been less mature than Mr. Phillips'."

The erumpent character of the perithecia of the above species and the 1-septate spores would place it in the genus *Nectriella.* No specimen of this species has been examined by the writer.

3. ELEUTHROMYCES Fuckel, Symb. Myc. 183. 1869

Perithecia free on the substratum, globose or subglobose, continued into a long neck, brownish or amber; substance soft; asci cylindrical, 4–8-spored; spores simple, fusiform, continued into a more or less bristle-like apex at either end.

Type species: *Eleuthromyces subulatus* Fuckel.

Distinguished from *Pseudonectria* by the flask-shaped perithecia and the appendiculate spores.

Perithecia large, 500 mic.–1 mm. high.	1. *E. subulatus.*
Perithecia small, 150–180 mic. high.	2. *E. Geoglossi.*

1. ELEUTHROMYCES SUBULATUS Fuckel, Symb. Myc. 183. 1869

?Clavaria brachiata Batsch, Elench. Fung. Cont. **1**: 234. 1786.
Sphaeria subulata Tode, Fungi Meckl. **2**: 44. 1791.
Isaria brachiata Schum. Pl. Saell. **2**: 443. 1803.
Sphaeronema subulatum Fries, Syst. Myc. **2**: 536. 1822.

Perithecia scattered or gregarious, subglobose below, tapering into a long neck, smooth or nearly so, yellowish or amber, 200–300 mic. in diameter at the base and 500 mic.–1 mm. high; asci cylindrical, fusoid, 8-spored, about 50 × 2–3 mic.; spores simple, elongated, averaging 4 × 2 mic., tapering into a bristle-like appendage of variable length at either end (*pl. 4. f. 12, 13*).

On partially decayed fungi.

TYPE LOCALITY: Europe.

DISTRIBUTION: Ontario.

ILLUSTRATIONS: Batsch, Elench. Fung. Cont. **1**: *pl. 28. f. 163;* Tode, Fungi Meckl. 2. *pl. 15. f. 117;* E. & P. Nat. Pfl. 1^1: *f. 238,* D–E; Nees, Syst. *pl. 43. f. 345,* B; Winter; Rab. Krypt. Fl. 1^2: 84. *f. 1–4.*

SPECIMENS EXAMINED: Ontario (no name).

Recognized by the very large perithecia.

2. **Eleuthromyces Geoglossi** (Ellis & Everh.)

Hypomyces Geoglossi Ellis & Everh. Jour. Myc. 2: 73. 1886.
Peckiella Geoglossi Sacc. Syll. Fung. 9: 944. 1891.

Perithecia superficial, closely gregarious, when fresh of a dirty greenish-yellow, when dry yellowish to amber, more or less furfuraceous, nearly globose, tapering into a rather long neck, 150 mic. in diameter at the base and 180 mic. high; asci slender, 50–75 × 4–5 mic., 8-spored; spores mostly 1-seriate, with the ends overlapping, hyaline, simple, tapering into an appendage-like extremity at either end, 10–12 × 3–4 mic. (*pl. 4. f. 10, 11*).

On *Geoglossum* sp.

TYPE LOCALITY: New Jersey.

DISTRIBUTION: New Jersey and New York.

SPECIMENS EXAMINED: New Jersey, *Ellis* (type); New York, *Seaver*.

Distinguished from the preceding by the much smaller perithecia as well as by the habitat.

The material collected by the writer in New York corresponds exactly with the type in spore characters but there is some difference in the color of the perithecia, those of the type being nearly black while those of our own collection are, with transmitted light, amber. As there are no notes on the color of the type specimen that difference might be due to drying.

This species was placed in the genus *Hypomyces* by Mr. Ellis but differs from the plants of this genus in the entire absence of stroma. Both the perithecial and spore characters strongly suggest the above genus.

4. **Pseudonectria** nom. nov.

Nectriella Sacc. Michelia 1: 51. 1877.

Perithecia free on the substratum, globose to ovoid, bright colored, yellow, red, etc., smooth or minutely rough, soft, membranaceous; asci cylindrical, 8-spored; spores elliptical or subelliptical, simple, hyaline.

Type species: *Nectria Rousseliana* Montag.

Distinguished from *Nectria* by the simple spores.

1. **Pseudonectria sulphurata** (Ellis & Everh.)

Nectria sulphurata Ellis & Everh. Proc. Acad. Nat. Sci. Phil. 1890: 248. 1891.

Perithecia small, about 200 mic. in diameter, at first globose finally collapsing, sulphur-yellow-pruinose, becoming green with age; asci cylindrical, 50–60 × 5–6 mic., 8-spored; spores more or less crowded in the ascus, becoming partially 2-seriate, hyaline, allantoid, elongated, with ends obtuse, 7–12 × 2–2.5 mic.

On dead wood of *Populus tremuloides*.

TYPE LOCALITY: Sand Coulee, Montana.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Sand Coulee, Montana, *Anderson* (type).

Ellis states in the description of this species: "Perithecia . . . covered with a sulphur-yellow granulose-pruinose coat which finally disappears and leaves the perithecia black." The type specimens from which our description is drawn shows the perithecia to be of a beautiful aeruginous-green color. This fact not being mentioned in the original description, it is probable that this change of color comes about with age.

The specimen in the herbarium of Mr. Ellis was first referred to the genus *Nectriella* Sacc. and afterwards described as a *Nectria*. While in very small spores it is often difficult to determine the presence or absence of the septum this seems to be a non-septate form and is therefore placed in the genus to which it would properly belong.

This species is entirely different from *Nectria sulphurea* Ellis & Calk., which occurs on old fungi.

DOUBTFUL SPECIES

Nectria mycetophila Peck, Ann. Rep. N. Y. St. Mus. **26**: 85. 1874. *Nectriella mycetophila* (Peck) Sacc. Syll. Fung. **2**: 449. 1883.

"Perithecia crowded or scattered, minute, smooth, subglobose, pale yellow when young, then pinkish-ochre. Ostiola minute, papillate, distinct, darker colored. Asci subclavate. Sporidia oblong, simple, 12–13 × 4 mic."

On decaying fungi.

TYPE LOCALITY: New York.

DISTRIBUTION: Known only from type locality.

The above description is quoted from Mr. Peck as no material is available for examination.

Hypocrea perpusilla Montag. Hist. Phys. Polit. et Nat. l'ile de Cuba. Pl. Cell. 335. 1838. *Nectriella perpusilla* (Montag.) Sacc., Michelia 1: 51. 1877.

5. NECTRIA Fries, Summa Veg. Scand. 387 (in part). 1849

Nectria Fries, Syst. Orbs. Veg. 105 (as possible genus). 1825. *Dialonectria* Sacc. (as subgenus) Syll. Fung. 2: 490. 1883. *Dialonectria* (Sacc.) Cooke, Grevillea 12: 77. 1884.

Plants parasitic or saprophytic; perithecia superficial, entirely free, scattered or occasionally crowded, without stroma or common subiculum but individual perithecia often surrounded near the base by a scant mycelial growth, globose, ovate or conical in form; perithecial wall composed of distinct coarse cells or cell structure obscure, smooth, pruinose, furfuraceous, clothed with deciduous or well-developed, flexuose or bristly hairs; ostiola papilliform, obtuse, or obscure; color from whitish to yellow, orange or blood-red to reddish-purple, varying much in a given species according to age and conditions; asci cylindrical or clavate, mostly 8-spored; spores hyaline, 1-septate, elliptical, fusoid or fusiform, constricted or non-constricted at the septum; paraphyses often present but delicate and indistinct.

Type species: *Sphaeria Peziza* Tode.

The genus as treated here is used in its restricted sense to include only those forms in which stroma and a common subiculum are entirely wanting.

Perithecia pale, ranging in color from orange to sulphur-yellow or whitish.
- Perithecia large, 250–300 mic. in diameter (mostly 300).
  - Naked or nearly so (occasionally clothed with deciduous mycelial threads).
    - Saprophytic on various substrata.
      - Perithecia smooth or nearly so; spores elliptical. — 1. *N. Peziza.*
      - Perithecia covered with coarse granules; spores fusoid. — 2. *N. tremelloides.*
    - Parasitic on foliaceous lichens. — 3. *N. diplocarpa.*
  - Clothed with a dense covering of sulphur-yellow hairs. — 4. *N. flavociliata.*
- Perithecia small, 100–150 mic. in diameter (mostly less than 200).
  - Densely clothed with hyaline hairs (white to the naked eye).

Spores broad-elliptical. 5. *N. lactea.*
Spores very slender, allantoid (1–2 mic. broad).
Spores 5 × 2 mic. 6. *N. Rexiana.*
Spores 6–7 × 1.5–2 mic. 7. *N. squamulosa.*
Naked and smooth or only minutely rough.
Spores large, 15–22 mic. long.
Spores allantoid; plants parasitic on lichens. 8. *N. rubefaciens.*
Spores fusoid or fusiform, nearly straight; plants saprophytic
Spores broad-fusoid, 7 or more mic. broad.
On foliage of dead cedar; spores 15 × 7 mic. 9. *N. thujana.*
On bark; spores 18–22 × 7–10 mic. 10. *N. dispersa.*
Spores narrow-fusoid (4 mic. broad) or fusiform.
Spores narrow-fusoid, 18–22 × 4–5 mic. 11. *N. Eucalypti*
Spores fusiform, 18–22 × 5–6 mic. 12. *N. Apocyni.*
Spores small, less than 14 mic. long (mostly 7–10).
Perithecia sulphur-yellow-pruinose; substratum yellow. 13. *N. sulphurea.*
Perithecia not sulphur-yellow-pruinose.
Perithecia pale, almost white, becoming subtruncate. 14. *N. truncata.*
Perithecia orange, fading to pale yellow, not truncate. 15. *N. conigena.*
Perithecia deep red, ranging in color from scarlet or blood-red to reddish-purple.
Perithecia with a few bristly hairs; plants on herbaceous stems. 16. *N. consors.*
Perithecia naked (with no well-developed hairs).
Perithecia conical or subconical in form.
Spores large, 15–17 × 5–6 mic. 17. *N. Papilionacearum.*
Spores small, 10–11 × 3–4 mic. 18. *N. Brassicae.*
Perithecia ovate; ostiolum very obtuse.
Spores narrow-fusoid; on wood. 19. *N. sanguinea.*
Spores broad-fusoid; on sphaeriaceous fungi. 20. *N. episphaeria.*

1. NECTRIA PEZIZA (Tode) Fries, Summa Veg. Scand. 288. 1849

Sphaeria Peziza Tode, Fungi Meckl. 2: 46. 1791.
? Peziza hydrophora Bull. Hist. Champ. 243. 1809.
Peziza (*Dasyscypha*) *vulpina* Cooke, Hedwigia 14: 82. 1875.
Dialonectria vulpina Cooke, Grevillea 12: 83. 1883.
Nectria rimincola Cooke, Grevillea 11: 108. 1883.
? Nectria lasioderma Ellis, Am. Nat. 17: 194. 1883.
Nectria Umbellulariae Plow. & Hark. Bull. Cal. Acad. Sci. 1: 26. 1884.
Nectria vulpina Ellis & Everh. N. Am. Pyrenom. 103. 1887.
Nectria betulina Rehm. Ann. Myc. 3: 519. 1905.

Perithecia superficial, scattered, gregarious or occasionally crowded, globose or subglobose, usually collapsing from the top becoming pezizoid, at first clothed with a scant covering of delicate, white mycelial threads (no true hairs) which disappear with age leaving the perithecia smooth or in very old specimens slightly rough and furfuraceous, 250–500 mic. in diameter (mostly 300), varying in color from deep-orange to pale-yellow, color darker in dried specimens but fading in weathered specimens; ostiolum minute in young specimens, just visible and in older forms depressed and inconspicuous; asci cylindrical or clavate, 8-spored, 50–75 × 5–6 mic.; spores broadly elliptical, obliquely 1-seriate or crowded, becoming partially 2-seriate, thick-walled, 1-septate, not constricted, with 1 large, conspicuous oil-drop in each cell, 10–14 × 4–6 mic. (mostly 10 × 5 mic.); paraphyses short, branched, not conspicuous (*pl. 4. f. 3; pl. 5. f. 1*).

On decaying, decorticated wood; more rarely on bark, fungi and old hemp cloth.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: New York to Ontario, North Dakota and Louisiana.

ILLUSTRATIONS: Tode, Fungi Meckl. 2: *pl. 15. f. 122;* Bulliard, Herb. France, *pl. 410. f. 2;* Currey, Trans. Linn. Soc. 22. *pl. 57. f. 44;* Berkeley, Outl. Brit. Fung. *pl. 24. f. 6;* Grevillea, Crypt. Fl. 4. *pl. 186. f. 2.*

EXSICCATI: Ravenel, Fungi Am. Exsicc. *644;* Ellis, N. Am. Fungi *774;* Wilson & Seaver, Ascom. & Lower Fungi, *16.* Other specimens examined: California, *Harkness;* Iowa, *Arthur, Seaver;* Louisiana, *Langlois;* Maine, *Harvey;* New York, *Atkin-*

son, Brown, Seaver; North Dakota, *Seaver* (various collections); New Jersey, *Ellis* (various collections); Ohio, *Hawkins, Morgan;* Ontario, Canada, *Dearness, Macoun.*

Distinguished by the large, pale, globose-pezizoid perithecia and the broad-elliptical, non-constricted spores.

A more complete account of this species is being published in the Bulletin of the Torrey Botanical Club.

2. NECTRIA TREMELLOIDES Ellis & Everh. Jour. Myc. 2: 121. 1886

Perithecia gregarious, subglobose, coarsely furfuraceous, orange, fading to pale yellow, about 300 mic. in diameter, with a scant, dirty whitish mycelial growth near the base; asci clavate, 50 × 7 mic.; spores 1-seriate or partially 2-seriate above, hyaline, 1-septate, fusoid, very slightly constricted, 9–13 × 3–4 mic. (*pl. 5. f. 3*).

On bark of dead willow.

TYPE LOCALITY: Louisiana.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Louisiana, *Langlois 592* (type).

Distinguished by the large coarsely furfuraceous perithecia.

This species has been reported but once and the type specimen seems to be quite distinct in the presence of the bran-like granules with which the perithecia are covered but whether this character is constant must be decided from a study of fresh material.

3. NECTRIA DIPLOCARPA Ellis & Everh. Proc. Phil. Acad. Sci. 1890: 244. 1891

Perithecia gregarious or scattered, occasionally several closely crowded, superficial, subglobose, 250 mic. in diameter, nearly smooth, collapsing when dry and becoming pezizoid, flesh-colored; asci clavate, 40–50 × 8–12 mic.; spores elliptical, 8–12 × 4–5 mic., 1-septate, hyaline; in addition to the ordinary ascospores there are other large, hyaline, 1-septate, spore-like bodies 30–45 × 18–25 mic. present in the perithecia (*pl. 5. f. 2*).

On thallus of foliaceous lichens (*Parmelia?*).

TYPE LOCALITY: New York.

DISTRIBUTION: New York to Missouri.

SPECIMENS EXAMINED: New York, *Brown* (type).

As to the nature of the large bodies present in the perithecia, which are truly spore-like, it is difficult to determine. Mr. Ellis was of the opinion that they represent mature ascospores while the smaller spores present in the ascus are immature. This seems doubtful to us since the large bodies could not be found within an ascus.

The species very closely resembles *Nectria Peziza* (Tode) Fries, both in perithecial and spore characters, but is distinguished by its parasitic habitat as well as by the presence of the large spore-like bodies which accompany the asci within the perithecia.

4. **Nectria flavociliata** nom. nov.

Nectria bicolor Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1893**: 443. 1893. Not *Nectria bicolor* Berk. & Br.

Perithecia thickly gregarious, large, 250–300 mic. in diameter, subglobose with a papilliform ostiolum, clothed, except a space around the ostiolum, with obtuse, septate, clavate hairs which are hyaline near the base but golden-sulphur-yellow near the apices; asci clavate, 35–40 × 7–8 mic., 8-spored; spores 2-seriate, crowded, fusoid, 1-septate, hyaline, 8–12 × 2.5–3 mic. (*pl. 5. f. 11*).

On dead twigs of *Carya*.

TYPE LOCALITY: Wilmington, Delaware.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Delaware, *Commons* (type).

Distinguished by the large, golden-yellow-ciliate perithecia.

"The yellow color of the hairy coat is the same as in *Nectria sulphurea* Ellis & Calk., but there is no subiculum, and in that species the perithecia are not hairy but simply pruinose. *Fusarium episphaericum* Cooke & Ellis* appears to be the conidial stage."

The hairs in this species are well developed and prominent. The name suggested by Ellis & Everh. is a homonym.†

5. NECTRIA LACTEA Ellis & Morgan; Ellis & Everh. N. Am. Pyrenom. 110. 1892

Perithecia minute, 125–200 mic. in diameter, nearly globose. gregarious or crowded, yellowish, at first clothed with a dense

* Grevillea 5: 50. 1876.

† Jour. Linn. Soc. 14: 116. 1875.

covering of delicate, white hairs so that the whole cluster of plants has a whitish appearance, except the ostiolum which is bare, becoming yellowish with age; hairs about 2 mic. in diameter, usually roughened externally with minute granules but occasionally smooth; asci cylindrical, 8-spored, 40–50 × 5 mic.; spores 1-seriate, broad-elliptical, hyaline, 1-septate, with 1 oil-drop in each cell, 5–8 × 3–4 mic. (*pl. 5. f. 5*).

On old fungi, *Polyporus, Stereum,* and also on rotten wood.

TYPE LOCALITY: Ohio.

DISTRIBUTION: New York to Ohio, Florida and Louisiana.

SPECIMENS EXAMINED: Florida, *Calkins;* New York, *Seaver;* Louisiana, *Langlois 1213;* Ohio, *Morgan* (type).

Distinguished by the broadly elliptical spores.

Two collections of fresh material of this species were made by the writer in the vicinity of New York City, during the autumn of 1906. The specimens collected were on old wood and correspond well with the type material of this species. In external appearance the species closely resembles *Nectria Rexiana* Ellis or *Nectria squamulosa* Ellis but spore characters are very different. The spores are similar in form and arrangement to those of *Nectria Peziza* (Tode) Fries but are much smaller.

6. NECTRIA REXIANA Ellis, Am. Nat. 17: 194. 1883

Perithecia nearly globose, yellowish, clothed with a dense covering of long, flexuose, hyaline (white to the naked eye), septate, rough hairs, perithecia 150–200 mic. in diameter; asci cylindrical, 30–40 × 4–5 mic., 8-spored; spores mostly 1-seriate or partially 2-seriate above, minute, cylindrical or allantoid, hyaline, faintly 1-septate, 5 × 2 mic. (*pl. 5. f. 6*).

Parasitic on *Chondrioderma.*

TYPE LOCALITY: New York.

DISTRIBUTION: Maine to New York.

SPECIMENS EXAMINED: New York, *Rex* (type); Maine, *Harvey.*

Distinguished by the comparatively large perithecia and small size of the spores.

7. NECTRIA SQUAMULOSA Ellis, Bull. Torrey Club 9: 20. 1882

Perithecia gregarious, minute, 100–125 mic. in diameter, light colored (when dry nearly white) with a prominent ostiolum which

is darker, clothed externally, except the ostiolum, with a dense covering of delicate, hyaline hairs which are 2 mic. in diameter and 10–20 mic. long; asci narrowed above and below, 20–25 × 5–6 mic., 8-spored; spores mostly 2-seriate, minute, 6–7 × 1.5–2 mic., 1-septate, sometimes very slightly constricted (*pl. 5. f. 7*).

On rotten wood.

TYPE LOCALITY: New Jersey.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: New Jersey, *Ellis* (type).

Distinguished from the preceding by the smaller perithecia and slightly larger spores.

This and the preceding species very closely resemble each other both in external and internal characters, however there seems to be a slight difference so the two are here allowed to remain as distinct.

8. NECTRIA RUBEFACIENS Ellis & Everh. Jour. Myc. 3: 116. 1887

Perithecia scattered or gregarious, superficial, subglobose, 80 mic. in diameter, smooth or with a few poorly developed hair-like outgrowths, at first pale, becoming orange; asci broad-clavate, 35–40 × 12 mic., 8-spored; spores irregularly crowded, cylindrical-allantoid, hyaline or subhyaline, 1-septate, scarcely constricted at the septum, 14–18 × 2–3 mic (*pl. 5. f. 8*).

Parasitic on the thallus of some lichen, on dead limbs.

TYPE LOCALITY: Newfield, New Jersey.

DISTRIBUTION: New Jersey.

SPECIMENS EXAMINED: New Jersey, *Ellis* (type).

Distinguished by the allantoid spores.

In the original description of this species Mr. Ellis states: "The species has been observed now for the past eight years and seems to be quite distinct from any of the other lichenicolous species." He also stated that the thallus of the lichen *Parmelia tiliacea* (*?*) turns dull red (bright red within). The spores in the specimens examined by the writer are pale reddish but Mr. Ellis describes them in the fresh material as being hyaline.

9. NECTRIA THUJANA Rehm; Sacc. Michelia 1: 295. 1878

Perithecia scattered, or gregarious, pale orange, nearly globose, becoming depressed and more or less pezizoid; asci clavate,

60–80 × 13 mic., 8-spored; spores partially 2-seriate, broad-fusoid, 1-septate, very slightly constricted, 17–18 × 7 mic., hyaline (*pl. 5. f. 9*).

On dead foliage of *Cupressus*.

TYPE LOCALITY: Newfield, New Jersey.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ellis, North Am. Fungi, *130*. Other specimens examined: New Jersey, *Ellis* (cotype).

Distinguished by the size of the broad-fusoid spores as well as by the habitat.

Our own examination shows the spores to be larger than indicated by Mr. Ellis in previous descriptions. The perithecia except for the smaller size somewhat resemble those of *Nectria Peziza* (Tode) Fries but the species is readily distinguished by the difference in the form and size of the spores.

10. NECTRIA DISPERSA Cooke & Ellis, Grevillea **5**: 33. 1876

? Nectria poliosa Ellis & Everh. Jour. Myc. **2**: 39. 1886.

? Lasionectria poliosa Ellis & Everh. Jour. Myc. **3**: 1. 1887.

Perithecia scattered, globose, with a minute ostiolum, orange, nearly smooth, collapsing; asci cylindrical, 70–80 × 10–12 mic. 8-spored; spores 1-seriate with the ends overlapping, subfusoid, a little constricted at the septum, often slightly unsymmetrical, with several oil-drops, hyaline, 18–22 × 7–10 mic.

On bark and old fungi.

Distinguished by the size of the spores.

TYPE LOCALITY: Maine.

DISTRIBUTION: Maine to (Florida ?).

ILLUSTRATIONS: Grevillea **5**: *pl. 75. f. 14.*

SPECIMENS EXAMINED: Maine, *Blake* (cotype): Florida, *Calkins 138.*

A note is enclosed with the type of this species in the Ellis collection stating that the last mature perithecium had been used in writing the description for the Journal of Mycology so that the writer has little to draw from in the present work except the description by Mr. Ellis. Accepting the spore measurements given by Mr. Ellis this character is sufficient to distinguish the species from any of the others listed in this paper.

Nectria poliosa Ellis & Everh. corresponds with the above in

spore measurements, but from the description apparently differs in possessing perithecia which are clothed with hairs; the type here again is too meager to permit of a fair examination. This latter character is one which is very uncertain in the present genus, the perithecia of many of the species which are usually considered smooth being clothed when young with mycelial threads which often fall off later. This character seems to be very variable depending upon age and other conditions. In only a few cases in the present genus are the perithecia found to be clothed with well-developed hairs.

11. NECTRIA EUCALYPTI (Cooke & Hark.) Sacc.
Syll. Fung. 9: 969. 1891

Dialonectria Eucalypti Cooke & Hark.; Cooke, Grevillea 12: 82. 1884.

Dialonectria depallens Cooke & Hark. Grevillea 12: 82. 1884.

Nectria depallens (Cooke & Hark.) Sacc. Syll. Fung. 9: 962. 1891.

Perithecia scattered, superficial, nearly globose, with a papilliform ostiolum, smooth, pale red to yellowish, entire or often collapsing, 200–250 mic. in diameter; asci clavate, 8-spored, 50–55 × 7–8 mic.; spores crowded, 18–22 × 4–5 mic., 1-septate, 2-seriate (*pl. 5. f. 10, 11*).

On *Eucalyptus* and stems of *Lupinus.*

TYPE LOCALITY: California.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: California, *Harkness* (probably cotype).

Distinguished by the pale perithecia and large fusoid spores.

Dr. Cooke in Grevillea (l. c.) distinguishes *Nectria depallens* (Cooke & Hark.) Sacc. from the above by a difference in the color of the perithecia the one being ochraceous and the other testaceous-red and by the larger size of the spores, those of *Nectria Eucalypti* being 16–18 × 4 mic. and *Nectria depallens* (Cooke & Hark.) Sacc. 22–24 × 4–4.5 mic. In the specimen examined by the writer of each of these species, both of which were collected in California by Harkness and are evidently cotype although not marked, the difference in the color of the perithecia is too slight and the character too variable to be considered. While

the difference in the size of the spores seems from the description to be quite marked, camera lucida drawings of the spores of the two specimens mentioned above which drawings accompany this paper show no marked difference either in form or size. I am unable to discover any character by which the two supposed species can be separated notwithstanding the fact that Saccardo (l. c.) has placed the two species in different subgenera.

12. NECTRIA APOCYNI Peck, Ann. Rep. N. Y. St. Mus. **26**: 84. 1874

Perithecia scattered or crowded in small clusters, subglobose, more or less collapsed when dry, slightly rough, dull red; ostiolum minute; asci clavate, 8-spored, 60–65 × 12 mic.; spores 2-seriate and often irregularly crowded, oblique, fusiform with ends acute, almost sharp, 1-septate, a little constricted at the septum, granular within, 18–22 × 5–6 mic. (*pl. 5. f. 12*).

On the lower part of the stems of Indian hemp, *Apocynum cannabinum*.

TYPE LOCALITY: North Greenbush, New York.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: New York, *Peck* (cotype).

The species is distinct in the large size and fusiform character of its spores.

The above description of the microscopic characters are taken from a part of the type collection which was received by the kindness of Mr. Peck. Other characters are recorded from his notes as the specimens are discolored with age and too small to draw conclusions as to the general appearance of the perithecia except that of the size. The species is easily distinguished from any of the other forms listed here by its fusiform spores which approach those of the genus *Hypomyces*.

Mr. Peck states (in letter) that he has seen this species but once. He has described the conidia as "subhemispherical or irregular, small, pale red; spores fusiform, straight, .0005–.0006 in. long." This description would seem to indicate the presence of a stroma although I have been unable to detect one. Until the species has been collected and studied from fresh material, it is difficult to decide this point.

13. NECTRIA SULPHUREA (Ellis & Calk.) Sacc.
Syll. Fung. 9: 966. 1891

Dialonectria sulphurea Ellis & Calk.; Ellis & Everh. Jour. Myc. 4: 57. 1888.

Perithecia scattered, sulphur-yellow-pruinose and seated on a sulphur-yellow-pruinose base 1 or more cm. in diameter, often becoming reddish-brown with age, 200 mic. in diameter; asci evanescent; spores small, fusoid with the ends obtusely pointed, 1-septate and constricted at the septum, often with an oil-drop in each cell, 7–12 × 3–4 mic. (*pl. 5. f. 13*).

Parasitic on old fungi, *Stereum*.

TYPE LOCALITY: Jacksonville, Florida.

DISTRIBUTION: Ohio to Florida.

EXSICCATI: Ellis & Everhart, N. Am. Fungi, *1947*. Other specimens examined: Florida, *Calkins* (type); Ohio, *Morgan*.

Distinguished by the sulphur-yellow-pruinose perithecia and the sulphur-yellow-pruinose base, as well as by the habitat.

While the perithecia are seated on the yellow base this does not resemble a stroma but the substratum seems to be stained being of the same color as the perithecia themselves. In both specimens examined it has been impossible to make out an ascus but the arrangement of the spores seems to indicate its presence.

14. NECTRIA TRUNCATA Ellis, Am. Nat. 17: 194. 1883

Perithecia minute, 125–150 mic. in diameter, gregarious, yellowish (dried specimens almost white), slightly collapsing, becoming subtruncate, or with the ostiolum still more depressed so as to appear umbilicate; asci when young tapering into a rather pointed apex, finally clavate, 8-spored, 35–40 × 5 mic.; spores crowded, fusoid, 1-septate, slightly constricted, 12 × 2–3 mic. (*pl. 5. f. 14*).

On the inside of white cedar bark which has been stripped from the tree.

TYPE LOCALITY: Newfield, New Jersey.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ellis, N. Am. Fungi, *1332*. Other specimens examined: Newfield, New Jersey, *Ellis* (type).

Distinguished by the small, pale perithecia and minute spores.

15. NECTRIA CONIGENA Ellis & Everh. Bull Torrey Club 10: 77. 1883

Dialonectria filicina Cooke & Hark. Grevillea 12: 101. 1884.
Nectria filicina Sacc. Syll. Fung. 9: 963. 1891.

Perithecia scattered or gregarious, often subcespitose, nearly globose with a minute ostiolum, smooth, orange, becoming pale yellow with age, entire or collapsing with age; asci clavate, 8-spored; spores partially 2-seriate or irregularly crowded, fusoid, 1-septate, slightly constricted, granular within, 8–10 × 3–4 mic. (*pl. 4. f. 8; pl. 5. f. 15, 16*).

On hard materials, stipe of tree fern, cone of *Magnolia,* shell of buckeye.

TYPE LOCALITY: Newfield, New Jersey.

DISTRIBUTION: New Jersey to Ohio and California.

SPECIMENS EXAMINED: New Jersey, *Ellis* (type); Ohio, *Morgan;* California *Harkness* (probably cotype of *Nectria filicina* Cooke & Hark.) Sacc.

Distinguished by the pale perithecia and small spores.

Aside from some comparatively slight variations in perithecia I can discover no character by which to distinguish *Nectria filicina* (Cooke & Hark.) Sacc. from *Nectria conigena* Ellis & Everh., although there seems to be a wide difference in the habitat of the two species. In the former the perithecia are mostly entire while in the latter they are partly collapsed. This difference however might be due to age since in both cases they show some tendency to collapse. The spores of the two forms are identical, as is shown from the accompanying drawing which was made with the aid of the camera lucida.

16. **Nectria consors** (Ellis & Everh.)

Dialonectria consors Ellis & Everh. Jour. Myc. 4: 122. 1888.
Nectriella consors Sacc. Syll. Fung. 9: 941. 1891.

Perithecia subconical, tapering above into an acute ostiolum, scarlet, minute, 125–150 mic. in diameter, clothed with bristle-like, obtusely pointed, septate, reddish hairs, except the ostiolum; asci clavate, 8-spored, 50 × 6–7 mic.; spores 2-seriate, fusoid, hyaline, 1-septate, 7–10 × 2–3 mic.

On dead stems of *Polygonum.*

TYPE LOCALITY: St. Martinsville, La.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Louisiana, *Langlois* (type).

Distinguished by the conical form of the perithecia and the bristle-like hairs.

The spores of this species were originally described as simple but our examination shows them distinctly 1-septate. Nothing is known of this species except from the type collection. In color the perithecia resemble those of *Nectria Brassicae* Ellis & Sacc. but differ from that species in the hairy perithecia. The species would seem to be very distinct in the presence of well-developed. bristle-like hairs which are colored slightly reddish. It is to be regretted that the type material of this species is so scant that it is impossible to make as careful study of the species as would otherwise.

17. **Nectria Papilionacearum** sp. nov.

Plants hypophyllous, scattered or gregarious, accompanying other sphaeriaceous fungi (*Pardiella*), surrounded at the base by a few white mycelial threads; perithecia subconical, bright red, nearly scarlet, 150–175 × 175–200 mic., walls coarsely cellular; cells very variable but averaging 8–10 mic. in diameter; asci clavate, 8-spored, 75 × 10 mic.; spores 2-seriate above, often 1-seriate below, fusoid, 1-septate, constricted at the septum, with 1 or more oil-drops in each cell, 15–17 × 5–6 mic. (*pl. 4. f. 7; pl. 5. f. 19*).

On leaves of papilionaceous plants, *Lespedeza* and *Rhynchosia,* accompanying other sphaeriaceous fungi (*Parodiella*).

TYPE LOCALITY: Missouri.

DISTRIBUTION: Missouri to S. Carolina.

EXSICCATI: Ravenel, Fungi Am. Ex. *647.* Other specimens examined: Missouri, *Kellermann, 1002, 1003.*

The specimens in Ravenel's exsiccati were distributed as *Nectria Peziza* Fries from which they are very different both in gross and microscopic characters.

The specimens collected by W. A. Kellermann in Missouri, from which this description is drawn, were first referred to *Nectria erubescens* Desm., from which they also differ in both external and spore characters. They were later referred to *Nectria episphaeria* (Tode) Fries, which they quite closely

resemble. The form of the perithecia, size of the spores and phyllogenous habitat are sufficient to set it apart as distinct from that species.

As to whether these plants occur on the living leaves no statement is made by the collectors, but the leaves appear to have been collected in the living condition and since the fungi which they accompany are reported to be parasitic it is likely that the *Nectria* also occurs on the leaves while living. Although accompanying *Parodiella* the plants do not seem to be parasitic on the fungus, but since in the three specimens examined the *Nectria* accompanies the *Parodiella* there may be a close relationship between the two fungi as well as between the fungi and the leguminose host on which they occur.

18. NECTRIA BRASSICAE Ellis & Sacc.
Michelia **2**: 374. 1881

Perithecia scattered or gregarious, subconical, entire or bilaterally-collapsing, blood-red, 120–150 mic. in diameter; perithecial wall composed of coarse cells, variable in form and size, 5–8 mic. in diameter; asci clavate, 60 × 7–8 mic., 8-spored; spores mostly 2-seriate, fusoid or subclavate, 1-septate, hyaline, 10–11 × 3–4 mic. (*pl. 5. f. 20*).

On herbaceous stems of various kinds, *Brassica, Solanum. Ipomoea,* etc.

TYPE LOCALITY: New Jersey.

DISTRIBUTION: New Jersey to Louisiana.

EXSICCATI: Ellis, N. Am. Fungi *572, 572b;* Ellis & Everhart's Fungi Columb. *1747.* Other specimens examined: New Jersey, *Ellis* (cotype); Louisiana, *Langlois 1208, 1775, 1804.*

Closely related to *Nectria sanguinea* (Bolton) Fries, but distinguished by a difference in the form and size of the perithecia as well as by a slight difference in the size and arrangement of the spores. The perithecia resemble in form, *Nectria Papilionacearum* Seaver, but the spores are very different.

19. NECTRIA SANGUINEA Fries, Summa Veg. Scand. 388. 1845

Sphaeria sanguinea Bolton, Fungi Halifax **3**: 121. 1789.
?Hypoxylon phoeniceum Bull. Herb. France, *pl. 487. f. 3.* 1790.

Nectria athroa Ellis & Everh. Proc. Acad. Nat. Sci. Phil., **1890**: 247. 1891.

Nectria viticola Berk. & Curt. Grevillea 4: 45. 1875.

Perithecia gregarious or scattered, superficial, ovoid, mostly entire, but often collapsing when prematurely dried, smooth, blood-red, shining, about 200–275 × 250–300 mic. when mature; ostiolum obtuse but very prominent; asci cylindrical, 60–75 × 6–7 mic., 8-spored; spores obliquely arranged in the ascus, 1-seriate below, partially 2-seriate, above, narrow fusoid or subelliptical, slightly constricted, 10–12 × 4–5 mic., granular within (*pl. 4. f. 6; pl. 5. f. 17*).

TYPE LOCALITY: Nova Scotia.

DISTRIBUTION: Nova Scotia to New Jersey, Ohio and Kansas.

ILLUSTRATIONS: Bolton, Fungi Halifax, 3: *pl. 121. f. 1;* Bulliard, Herb. France *pl. 487. f. 3.*

SPECIMENS EXAMINED: Alabama, *Peters 5225* (cotype of *N. viticola* Berk. & Curt.); New Jersey, *Ellis;* New York, *Seaver;* Ohio, *Morgan;* Kansas, *Kellerman & Swingle 1325.*

Distinguished by the blood-red, ovoid, mostly entire perithecia and their habitat on rotten wood.

This species is usually attributed to Sibthorp,* although Bolton's description quoted above antedates that of Sibthorp by five years. No type specimen of this species has been seen and it is doubtful if such exists but the species is so well defined that Bolton's description and accompanying illustrations leave little chance for doubt as to its identity. The species is fairly well marked by the ovoid, blood-red perithecia which occur on rotten wood entirely destitute of stroma. The following is the note accompanying the original description.

"This *Sphaeria* grows on putrid wood; great numbers grow in close neighborhood but do not in any wise adhere to one another. They are oval or egg-shaped; the base broader than the top. Each has a perforation in the top, and is about the size of a poppy seed, as in the lower figure; the other figures shew them as they appear when magnified and cut both perpendicularly and horizontally. The colour on the outside is deep, bright bloody hue; the surface shining with a gloss like polished coral; the inside and seeds are white."

* Sibth. Fl. Oxoniensis 404. 1794.

The perithecia and spores of *Nectria athroa* Ellis & Everh. are a little smaller than the average of this species but this may be due to immature specimens. In other respects this is a typical specimen of the above species.

20. NECTRIA EPISPHAERIA (Tode) Fries, Summa Veg. Scand. 388. 1845

Sphaeria episphaeria Tode, Fungi Meckl. 2: 21. 1791.

Perithecia gregarious or scattered, superficial, subovoid, for the most part bilaterally collapsing when dry, smooth, blood-red, perithecial wall composed of rather coarse cells, perithecia variable but ranging from 150–250 mic. in diameter; asci cylindrical, 60 × 5 mic., 8-spored; spores obliquely 1-seriate, broad-fusoid, 4–6 × 9–12 mic. (mostly 5 × 10), 1-septate, hyaline (*pl. 4. f. 1, 2; pl. 5. f. 18*).

On old fungi of various kinds, especially sphaeriaceous fungi.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: New York to California and Canada to Nicaragua.

ILLUSTRATION: Tode, Fungi Meckl. 2: *pl. 11. f. 89.*

EXSICCATI: Ellis, N. Am. Fungi *469, 469 (b)*; Ravenel, Fungi Am. Exsicc. *340;* Smith, Central Am. Fungi *4.* Other specimens examined: Alabama, *Carver 305, Earle;* California, *Harkness;* Connecticut, *Thaxter;* Kansas, *Kellerman & Swingle;* Louisiana, *Langlois;* Maine, *White;* New Hampshire, *Farlow;* New Jersey, *Ellis, Brown, Small;* New York, *Peck;* North Dakota, *Seaver* (various collections); Nicaragua, C. Am., *Smith;* S. Carolina *Ravenel 551.*

Distinguished by the broad-fusoid spores as well as by the habitat and manner of collapsing.

This species very closely resembles the preceding and is considered by most writers as scarcely distinct. The habitat and manner of collapsing are usually given as the distinguishing characters. From our own studies the species would seem to differ in the spore characters as well. In the present species the spores are broad-fusoid and approximately twice as long as broad, while in the preceding, *Nectria sanguinea* (Bolton) Fries, they are narrow-fusoid or approximately three times as long as broad. This difference is shown in the camera lucida drawing of the two

species which accompanies this paper, which drawings are made from material which is typical of the two species. A careful study of material from widely different localities is necessary in order to determine whether or not this character is constant.

DOUBTFUL SPECIES

Dialonectria gibberelloides Ellis & Everh. Jour. Myc. 4: 122. 1888. *Nectria gibberelloides* (Ellis & Everh.) Sacc. Syll. Fung. 9: 963. 1891.

Perithecia scattered, nearly black (quite black in dried material), 150–200 mic. in diameter, contracted into a stem-like base below, finally collapsing; asci clavate, 8-spored, 35 × 5–6 mic.; spores partially 2-seriate, fusoid, 1-septate, straight or slightly curved, hyaline, 12–15 × 2.5–3 mic.

On dead stalks of *Zea Mays*.

TYPE LOCALITY: Louisiana.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Louisiana, *Langlois 1457* (type).

As would be inferred by the specific name, this species resembles a *Gibberella* but differs in the absence of blue color from the perithecia, the 1-septate spores and a difference in the form of the perithecia. The spores resemble those of the genus *Nectria* but it is doubtful from the general appearance of the plants if they should be included with this genus. If color be regarded strictly as a characteristic of the order Hypocreales this species could scarcely be included with the order.

Nectria (*Lasionectria*) *setosa* Ferd. & Winge, Bot. Tidsskrift 29: 11. 1908.

Perithecia superficial, scattered or slightly gregarious, at first globose, then plane when dry pezizoid-collapsing, 250–500 mic. in diameter, flesh-colored or orange, hairs scattered, of the same color, rigid, thickened below, above slightly attenuate and finely divided (conidiophorous) as long as 100 mic., principally near the base; asci when young, lanceolate-subfusoid, when mature cylindrical-clavate, 50–70 mic. (p. sporif.) × 8–10.5 mic., narrowed into stem as long as 20 mic.; 8-spored; spores above 2 seriate, below 1-seriate oblong-elliptical, ends rotundate, not at all or scarcely constricted at the septum, 12–14.5 × 5–6 mic., hyaline.

On decayed dried sheaths of *Musa* sp.

TYPE LOCALITY: St. Thomas, W. Indies.

DISTRIBUTION: St. Thomas to St. John.

ILLUSTRATIONS: Bot. Tidsskrift **29**: *pl. 1. f. 4.*

No type specimen of this species has been seen, but a specimen collected on decaying leaves of *Musa* in Jamaica by Dr. W. A. Murrill corresponds well with the above description. The specimens examined differ from *Nectria Peziza* (Tode) Fries, which they quite closely resemble in general appearance, in the nature of the fairly well developed hairs which clothe the perithecia, and also in the spores, which are longer and proportionately narrower than in that species. Also, the perithecia are of a deeper red color.

6. CALONECTRIA de Not. Comm. Critt. Ital. **2**: 477. 1867

Perithecia free, often closely gregarious, or scattered, with no true stroma but perithecia often surrounded with radiating white mycelia which give to some of the species a stromate appearance; perithecia globose to ovate, red or yellow; asci elongated, 8-spored; spores elongated, more than 1-septate.

Type species: *Calonectria Daldiniana* de Not.

Distinguished from *Nectria* by the many-septate spores. The genus as treated here is used in its restricted sense including only the non-stromatic species. The three species described here occur on the remains of other fungi so that the substratum with the white mycelium which surrounds each perithecium gives the stromatic appearance but close examination will show the perithecia to be entirely free, not connected by a stroma or stromatic base.

Spores small, not exceeding 15 mic. in length.	1. *C. erubescens.*
Spores large, 25–35 mic. in length.	
Spores subelliptical; plants occurring on fungi on dead branches.	2. *C. diminuta.*
Spores fusiform; plants on leaves.	3. *C. melioliodes.*

1. CALONECTRIA ERUBESCENS (Rob.) Sacc.
Michelia **1**: 309. 1878.

Sphaeria erubescens Rob.; Desm. Ann. Sci. Nat. III. **6**: 72. 1846.

Perithecia minute, gregarious in clusters or scattered, surrounded by a scant growth of radiating mycelial threads, at first pale red, fading to pale yellow, subglobose, with a minute ostiolum, often collapsing when dry, becoming pezizoid; asci clavate,

35–40 × 6 mic., 8-spored; spores crowded, small, elliptical to fusoid, 1–3-septate, 10–12 × 2–3 mic.

On living leaves of various kinds, usually on the remains of *Meliola*.

TYPE LOCALITY: France.

DISTRIBUTION: Florida.

EXSICCATI: Desm. Pl. Crypt. de France *1766* (cotype). Other specimens examined: Florida, *Nash 1955, Calkins 66,* and *Martin.*

In the original description of this species no mention is made of its occurrence on *Meliola* but aside from this fact the American material examined conforms well with that from Europe.

2. CALONECTRIA DIMINUTA (Berk.) Berl. & Vogl.; Sacc. Syll. Fung. **9**: 985. 1891

Nectria diploa diminuta Berk. Grevillea **4**: 46. 1875.

Dialonectria diminuta Cooke, Grevillea **12**: 83. 1884.

? Calonectria Dearnessii Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 245. 1891.

Perithecia minute, 150–175 mic. in diameter, scattered or more or less crowded on the substratum surrounded by radiating mycelium giving somewhat the appearance of a stroma while no true stroma is present, orange, partially collapsing; asci cylindrical or clavate, 8-spored; spores irregularly crowded, variable in size and form, elliptical, clavate or subfusoid, usually 3-septate, hyaline, 25–35 × 6–7 mic.

On sphaeriaceous fungi, *Massaria,* etc.

DISTRIBUTION: S. Carolina to Canada (?).

EXSICCATI: Ellis & Everh. N. Am. Fungi *2548*. Other specimens examined: London, Ontario, *Dearness 1346* (type of *C. Dearnessii* Ellis & Everh.).

3. CALONECTRIA MELIOLOIDES Speg. Anal. Soc. Ci. Argent. **19**: 41. 1886

Calonectria guarapiensis Speg. Anal. Soc. Ci. Argent. **19**: 41. 1886.

Plants gregarious and surrounded by an evanescent, white mycelial growth consisting of delicate radiating hyphae; perithecia subglobose to ovate, 200–250 mic. in diameter with the wall composed of irregular cells 5–8 mm. in diameter, clothed with a

few rigid, hyaline, many-septate hairs with a bulbose base; hairs 7–8 mic. in diameter and 200–400 mic. long; asci clavate, 8-spored, 80–100 × 12–15 mic.; spores 2-seriate or irregularly crowded, fusiform, 3-septate, hyaline, 30–35 × 7–8 mic.

On the mycelium of *Meliola* on living leaves.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Louisiana.

EXSICCATI: Roumeguere, Fungi Sel. Exsicc. *4141* (cotype); Roumebuere, Fungi Gall. Exsicc. *4047* (cotype of *C. guarapiensis* Speg.); Louisiana, *Langlois 2224*.

This species resembles in external appearance as well as in habitat the various specimens of *Calonectria erubescens* (Rob.) Sacc., but are easily distinguished by the difference in form and much larger spores. Also in some of the specimens examined the two species seem to occur together, some of the perithecia containing the large spores and others the small spores which are characteristic of the two species respectively.

DOUBTFUL SPECIES

Calonectria Curtisii (Berk.) Sacc. Michelia 1: 316. 1878.

7. OPHIONECTRIA Sacc. Michelia 1: 323. 1878

Perithecia scattered or gregarious, globose or pyriform, superficial, light-colored, yellow or brownish; asci cylindrical to clavate, 8-spored; spores very much elongated, approaching filiform, at least 10 times as long as broad, many-septate.

Type species: *Nectria trichospora* Berk. & Br.

The genus is distinguished from *Calonectria* by the spores, which are much longer, approaching or entirely filiform. Only the non-stromatic forms are treated here.

Perithecia globose or subglobose, spores 35–50 mic. long, on fungi.	1. *O. cerea.*
Perithecia elongated, substipitate, spores 60–75 mic.	2. *O. cylindrothecia.*

1. OPHIONECTRIA CEREA (Berk. & Curt.) Ellis & Everh. N. Am. Pyrenom. 118. 1892

Sphaeria cerea Berk & Curt. Grevillea 4: 108. 1876.

Calonectria cerea Sacc. Syll. Fung. 2: 551. 1883.

Nectria (*Calonectria*) *fulvida* Ellis & Everh. Jour. Myc. 1: 140. 1885.

Dialonectria fulvida Ellis & Everh. Jour. Myc. 2: 136. 1886.

Ophionectria Everhartii Ellis & Galw. Jour. Myc. 6: 32. 1890.

Perithecia gregarious, nearly globose, dull yellow becoming darker with age, more or less rough and furfuraceous externally, or with a few hair-like outgrowths, with a papilliform ostiolum, 150–175 mic. in diameter; asci cylindrical, 8-spored, 65–80 × 8–12 mic.; spores varying from fusiform to cylindrical or clavate, straight or curved, with the ends usually acute, hyaline or very pale yellow, 7–10-septate, 35–50 × 3–3.5 mic.; paraphyses short, indistinct.

On old fungi, especially *Diatrype*.

TYPE LOCALITY: S. Carolina.

DISTRIBUTION: Newfoundland and Ontario to S. Carolina.

ILLUSTRATION: Ellis & Everh. N. Am. Pyrenom. *pl. 15. f. 1–3.*

SPECIMENS EXAMINED: Newfoundland, *Waghorne 755;* Ontario, *Dearness 2292;* New Jersey, *Ellis* (type of *D. fulvida* and *O. Everhartii*).

Distinguished by the globose, slightly furfuraceous perithecia and by the habitat.

2. **Ophionectria cylindrothecia** sp. nov.

Perithecia gregarious or scattered, cylindrical to clavate or fusoid, tapering below into a stem-like base, also tapering above, yellowish, translucent, nearly smooth, rather hard when dry, often with a few septate, hair-like mycelial strands near the base. naked above, 125–150 × 275–300 mic.; asci cylindrical or clavate, 8-spored, 100–125 × 12–15 mic.; spores apparently enclosed in a separate membrane within the ascus, so that the outer wall of the ascus stretches 10–20 mic. beyond the apex of the spore cluster; individual spores tapering toward either end, hyaline or very slightly yellowish, 7–12-septate, 60–75 × 5 mic.; paraphyses present, indistinct (*pl. 4. f. 4*).

On old corn stalks, *Zea Mays*.

TYPE LOCALITY: Ohio.

DISTRIBUTION: Known only from type locality.

Ohio, *Morgan 1007* (type).

Distinguished by the elongated perithecia and the large size of the asci and spores as well as by the habitat.

This specimen in the Ellis collection and also in the material received from Mr. Morgan, which is a part of the type collection, is labeled *Ophionectria cerea* (Berk. & Curtis) Ellis & Everh., but examination of this material shows it to be entirely different from other specimens of *Ophionectria cerea* (Berk. & Curtis) Ellis & Everh. in external as well as in microscopic details. Its habitat is also entirely different from that species.

9. NEOCOSMOSPORA Smith, U. S. Dept. Agric. Div. Veg. Phys. Path. Bull. **17**: 7–59. *pl. 1–10.* 1899

Perithecia as in *Nectria* (bright red in the known species); asci numerous; ascospores in one row, brown, globose or short-elliptical, continuous, with a distinct, wrinkled exospore (the latter sometimes wanting in smaller spores); paraphyses present, inconspicuous, broad, loosely jointed, unbranched, consisting of about 5 cells.

Three conidial stages, *Cephalosporium, Fusarium* and *Oidium.*

1. Microconidia (*Cephalosporium* stage). Spores colorless, oval to narrow-elliptical, straight or slightly curved, simple, 4–25 × 2–6 mic., borne singly on the ends of short branches of a mycelium which fills the water ducts and interior parts of the living stems of melon and cowpea, conidia often 1–2-septate in cultures.

2. Macroconidia (*Fusarium* stage). Spores lunulate, 3–5-septate, 30–40 × 4–6 mic., borne on the surface of dead stems in immense numbers on innumerable, small, oval or hemispherical conidial beds; conidiophores compact, irregularly branched, single spores colorless, in mass pink to deep salmon-color.

3. On the surface of the dead stems of watermelon and in old cultures of the melon fungus on horse dung, globose, thin-walled, smooth, terminal or intercalary bodies are formed, in mass brick-red, individuals 10–12 mic. in diameter, extreme limits, 7–15 mic.

Type species: *Fusarium vasinfectum* Atk.

The position of this genus is uncertain.

1. NEOCOSMOSPORA VASINFECTA (Atk.) Smith, U. S. Dept. Agric. Div. Veg. Phys. Path. Bull. **17**: 7–50. *pl. 1–10.* 1899

Fusarium vasinfectum Atk. Ala. Agric. Exp. Sta. Bull. **41**: 28. 1892.

Perithecia gregarious, often closely crowded, bright red, smooth, with a very prominent, obtuse ostiolum, becoming per-

forate; perithecial wall composed of large cells, 12–15 mic. in diameter; perithecia 200–225 × 250–275 mic.; asci nearly cylindrical, 8-spored, 85–90 × 12–15 mic.; spores 1-seriate or often irregularly crowded, globose or subglobose, at first hyaline and surrounded with a transparent exospore, becoming brown, with several large oil-drops within, at maturity outer surface becoming wrinkled and rough, mostly 10 × 10 mic. in diameter; paraphyses present, inconspicuous, simple, septate.

Parasitic on cotton and okra, *Gossypium herbaceum, G. Barbadense* and *Hibiscus esculentus.*

TYPE LOCALITY: Alabama.

DISTRIBUTION: S. Carolina to Virginia and Arkansas.

EXSICCATI: Ellis & Everhart's Fungi Columbiana *1434.* Other specimens examined: Alabama, *Earle* (for perithecial characters).

Neocosmospora vasinfecta tracheiphila Smith, l. c.

Nectriella tracheiphila Smith, Proc. A. A. A. Sci. 44: 190. 1895 (hyponym).

Perithecia as above, spores mostly 12 × 12 mic. Parasitic on cowpea, *Vigna sinensis.*

Neocosmospora vasinfecta nivea Smith, l. c.

Fusarium niveum Smith, Proc. Am. Ass. Adv. Sci. 43: 289. 1894 (hyponym).

Perithecia as above; spores globose or elliptical, wrinkled or smooth generally smaller than in the preceding and more often elliptical. Parasitic on watermelon.

10. MELANOSPORA Corda, Ic. Fung. 1: 24. 1837.

Perithecia superficial, without stroma, globose-pyriform, with a long neck, usually clothed at the tip with a fringe of hairs and perithecia often hairy; asci broad-clavate, 4–8-spored; spores simple, colored, brown or brownish-black.

Type species: *Melanospora Zamiae* Corda.

The genus *Melanospora* is distinguished from *Ceratostoma* mainly by the lighter color and less decidedly carbonaceous perithecia. The two genera grade so closely into each other that it becomes difficult to draw a fast line between them although some of the species show undoubted relationship with the Hypocreales.

Of the three species recorded for North America one undoubtedly belongs to this genus while the other two are here included doubtfully.

1. MELANOSPORA CHIONEA (Fries) Corda, Ic. Fung. 1: 24. 1837

Ceratostoma chioneum Fries, Obs. Myc. 2: 340. 1818.
Sphaeria chionea Fries, Syst. Myc. 2: 446. 1822.

Perithecia gregarious or scattered, globose, clothed with a dense covering of white hairs, with a light colored beak up to 1 mm. long and 100 mic. in diameter, clothed with a few hairs at the apex; hairs which clothe the perithecia, 3 mic. in diameter, septate, long and flexuose; asci evanescent, obovate-clavate, stipitate, 8-spored, 35–40 × 13–16 mic.; spores 2-seriate or irregularly crowded, globose-elliptical, brown, 10–12 × 9–10 mic. (*pl. 4. f. 9*).

On decaying pine leaves and more rarely on leaves of deciduous trees.

TYPE LOCALITY: Europe.

DISTRIBUTION: Ontario.

ILLUSTRATIONS: Fries, Obs. Myc. 2: *pl. 7. f. 2;* Corda, Ic. Fung. 1: *pl. 7. f. 297 B;* Ellis & Everh. N. Am. Pyrenom. *pl. 14. f. 1–5.* Winter, Rabenh. Krypt. Fl. 1²: 85. *f. 1–3.*

SPECIMENS EXAMINED: Ontario, *Dearness 1370.*

The American material of this species corresponds very closely with European specimens examined except in the matter of habitat. A specimen of the species from the herbarium of Fries is contained in the collection of the New York Botanical Garden but unfortunately it shows no perithecia, these having doubtless been removed by those who have previously studied the specimen. Other European specimens have been studied with which our material is identical.

DOUBTFUL SPECIES

Melanospora parasitica Tul. & Tul. Sel. Fung. Carp. 3: 10. 1865. *Sphaeronema parasitica* Tul. Ann. Sci. Nat. IV. 8: 40. (Note 2). *Ceratostoma biparasiticum* Ellis & Everh. Bull. Torrey Club 24: 127. 1897.

Perithecia scattered, enveloped in a growth of white, septate, mycelial threads about 3 mic. thick, black, at least when mature, ovate, 100–175 mic. in diameter, with a long, slender, naked beak, about 1 mm. in length and 30–40 mic. in diameter; asci clavate, 8-spored, 20 × 6 mic.; spores elongated, cylindrical, with the ends rounded, pale brownish, 6–7 × 2 mic.

Parasitic on stems of *Isaria farinosa.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Ohio to New York.

ILLUSTRATIONS: Tul. & Tul. Sel. Fung. Carp. 3: *pl. 3. f. 11–14;* Grevillea 11: *pl. 158. f. 3.*

SPECIMENS EXAMINED: Ohio, *Lloyd;* New York, *Wilson, Seaver.*

Sphaeria lagenaria Pers. Syn. Fung. 58. 1801. *Ceratostoma lagenarium* Fries, Summa Veg. Scand. 396. 1849. *Auerswaldia lagenaria* Rabenh. Hedwigia 1: 116. 1856. *Melanospora lagenaria* (Pers.) Fuckel, Symb. Myc. 1: 126. 1869.

Perithecia scattered or gregarious, nearly globose, sparingly clothed with pale brown hairs, 400–500 mic. in diameter, with a beak, 1–2 mm. long and 100 mic. in diameter, tip of beak clothed with hyaline hairs, entire perithecium at maturity black; asci broad-clavate, 35–40 × 12–15 mic.; spores elliptical or fusoid, at first hyaline, becoming dark brown, 12–16 × 10–11 mic.

On old fungi (*Polyporus*).

TYPE LOCALITY: Europe.

DISTRIBUTION: New York.

SPECIMENS EXAMINED: New York, *Clinton.*

In this and the preceding species the perithecia are entirely black (at least in mature specimens). From general appearance it would seem doubtful to the writer if they should be included with this genus.

11. LETENDRAEA Sacc. Michelia 2: 73. 1880.

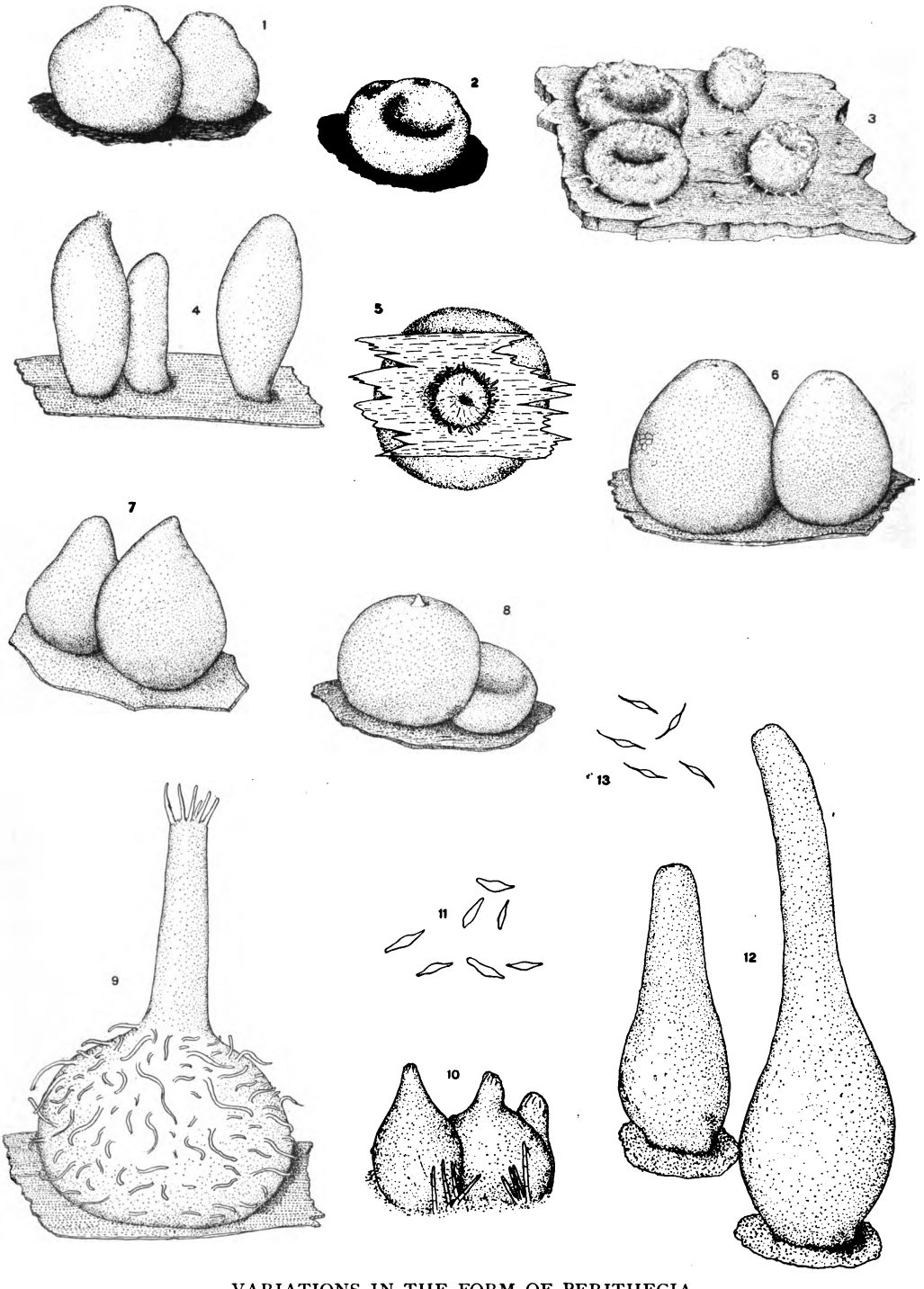
Perithecia superficial, gregarious, globose or ovate, with a papilliform ostiolum; asci 8-spored, cylindrical or clavate; spores elliptical or fusoid, 1-septate, brown.

Type species: *Letendraea eurotioides* Sacc.

Distinguished from subgenus *Phaeonectria* Sacc. by the absence of stroma.

1. LETENDRAEA LUTEOLA Ellis & Everh. Proc. Phil. Acad. Sci. 1895: 415. 1895

Perithecia gregarious, 250–300 mic. in diameter, brown, becoming black with extreme age, with a prominent ostiolum, entire or occasionally collapsing; asci cylindrical, 75 × 5 mic.; spores mostly 1-seriate or partially 2-seriate above, elliptical, straight



VARIATIONS IN THE FORM OF PERITHECIA

or slightly curved, becoming brown, 1-septate, scarcely constricted at the septum, with an oil-drop in each cell, 10–12 × 4–5 mic.; paraphyses present, delicate.

On rotten wood.

TYPE LOCALITY: Ohio.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Ohio, *Morgan 1109* (type).

In the specimens examined the perithecia are gregarious but with no apparent stroma. The large brown perithecia and the brown septate spores are sufficient characters by which the species may be recognized.

EXPLANATION OF PLATE IV.

1. *Nectria episphaeria* (Tode) Fries. The perithecia as they appear when moist, × 85.
2. *Nectria episphaeria* (Tode) Fries. One of the bilaterally collapsing perithecia as they appear when dry, × 85.
3. *Nectria Peziza* (Tode) Fries. Perithecia subglobose, pezizoid-collapsing, × 30.
4. *Ophionectria cylindrothecia* Seaver. Perithecia subcylindrical, × 85.
5. *Hyponectria dakotensis* Seaver. Perithecia subepidermal, × 100.
6. *Nectria sanguinea* (Bolton) Fries. Perithecia ovate, entire, × 85.
7. *Nectria Papilionacearum* Seaver. Perithecia subconical, × 85.
8. *Nectria conigena* Ellis & Everh. Perithecia entire or pezizoid-colapsing, × 85.
9. *Melanospora chionea* (Fries) Corda. Perithecia flask-shaped, hairy, × 85.
10. *Eleuthromyces Geoglossi* (Ellis & Everh.) Seaver. Perithecia subflask-shaped, × 85.
11. *Eleuthromyces Geoglossi* (Ellis & Everh.) Seaver. Subappendiculate spores, × 1,000.
12. *Eleuthromyces subulatus* Fuckel. Perithecia subflask-shaped, × 85.
13. *Eleuthromyces subulatus* Fuckel. Appendiculate spores, × 1,000.

EXPLANATION OF PLATE V.

The spores on this plate were drawn with the camera lucida, the object being to show the comparative size and form of the spores in the different species of the genus *Nectria*. The drawings are from type material where such is available. In a few cases the type specimens were too scant to permit of such drawings.

1. *Nectria Peziza* (Tode) Fries. Drawn from material collected by the writer.
2. *Nectria diplocarpa* Ellis & Everh. Drawn from type material.
3. *Nectria tremelloides* Ellis & Everh. Drawn from type material.
4. *Nectria flavociliata* Seaver. Drawn from type material.
   Nectria bicolor Ellis & Everhart. Drawn from type material.
5. *Nectria lactea* Ellis & Morgan. Drawn from type material.
6. *Nectria Rexiana* Ellis. Drawn from type material.
7. *Nectria squamulosa* Ellis. Drawn from type material.
8. *Nectria rubefaciens* Ellis & Everh. Drawn from type material.
9. *Nectria thujana* Rehm. Drawn from Ellis, N. Am. Fungi 160. This material was collected in the type locality and identified by Mr. Ellis, who collected the type material. Cotype material has been examined, but the perithecia are so scarce that it was impossible to find any in good condition.
10. *Nectria Eucalypti* Cooke & Harkness. Drawn from material collected by Harkness in the type locality. Probably cotype.
11. *Nectria depallens* Cooke & Harkness. Drawn from material collected by Harkness. Probably cotype.
12. *Nectria Apocyni* Peck. Drawn from cotype material.
13. *Nectria sulphurea* Ellis & Calkins. Drawn from type material.
14. *Nectria truncata* Ellis. Drawn from type material, in which it was difficult to find mature spores.
15. *Nectria conigena* Ellis & Everh. Drawn from type material.
16. *Nectria filicina* Cooke & Harkness. Drawn from material collected by Harkness. Probably cotype.
17. *Nectria sanguinea* (Bolton) Fries. Drawn from Rehm's Ascomyceten 1771.
18. *Nectria episphaeria* (Tode) Fries. Drawn from material collected in Ohio on *Diatrype* sp.
19. *Nectria Papilionacearum* Seaver. Drawn from type material.
20. *Nectria Brassicae* Ellis & Sacc. Drawn from N. Am. Fungi 572. Probably cotype.

SPORES OF SPECIES OF NECTRIA

[Reprinted from MYCOLOGIA, Vol. I., No. 5, September, 1909.]

THE HYPOCREALES OF NORTH AMERICA—II

FRED J. SEAVER

(WITH PLATE 13, CONTAINING 15 FIGURES)

Tribe II. CREONECTRIEAE

Conidial phase profuse, giving rise to a stroma producing at first conidiophores and conidia, later perithecia; stroma fleshy, depressed, tubercular or stalked, conidia variable; perithecia seated on or surrounding the stroma; usually in dense cespitose clusters or occasionally scattered but always entirely superficial; perithecia and spores as in Nectrieae.

Stroma upright, stalked, surrounded at the base by the cespitose perithecia.	
Spores 1-septate.	12. SPHAEROSTILBE.
Spores muriform.	13. MEGALONECTRIA.
Stroma depressed or tubercular, often concealed at maturity by the perithecia.	
Spores simple.	
Spores hyaline.	14. ALLANTONECTRIA.
Spores brown.	15. SPHAERODERMATELLA.
Spores compound.	
Spores 1-septate.	
Spores hyaline.	16. CREONECTRIA.
Spores brown.	17. MACBRIDELLA.
Spores more than 1-septate.	
Perithecia dark blue (black to naked eye).	18. GIBBERELLA.
Perithecia bright colored, red, yellow, etc.	
Perithecia cespitose on a depressed stroma.	19. SCOLECONECTRIA.

[MYCOLOGIA for July, 1909 (1: 131–176), was issued 22 July 1909.]

Perithecia echinulately arranged on a subglobose stroma.	20. ECHINODOTHIS.
Spores muriform.	
Spores hyaline.	21. THYRONECTRIA.
Spores brown.	22. THYRONECTROIDEA.

12. SPHAEROSTILBE Tul. Fung. Carp. 1: 130 (in note). 1861

Stroma (*Stilbum, Atractium, Microcera*) consisting of a slender stalk with a subglobose head or conical in form; perithecia bright colored, membranaceous, globose, subglobose or ovate; asci cylindrical or subcylindrical, 8-spored; spores hyaline, 1-septate, elliptical or subelliptical.

Type species: *Stilbum aurantiacum* Babingt.

Stroma consisting of a slender stalk with a clavate or subglobose head.	
Spores small, 10–14 × 4–6 mic.	1. *S. gracilipes.*
Spores large, 22–26 × 7 mic.	2. *S. cinnabarina.*
Stroma conical in form.	
On bark.	3. *S. flammea.*
On scale insects.	4. *S. coccophila.*

1. SPHAEROSTILBE GRACILIPES Tul. Fung. Carp. 1: 130. 1861

Strilbum gracilipes Tul. Ann. Sci. Nat. IV. 5: 114. 1856.

Stilbum corynoides Ellis & Everh. Jour. Myc. 1: 153. 1885.

Stroma consisting of a slender stalk 2–3 mm. high of a grayish color with a globose, orange head .5–1 mm. in diameter; conidia elliptical, hyaline, 5–6 × 2 mic.; perithecia in dense cespitose clusters 1–2 mm. in diameter at the base of the stalked stroma, 15–30 in each cluster, reddish, becoming pale (in dried specimens often pale yellow), 250–300 mic. in diameter, nearly globose, partially collapsing or entire, slightly roughened; asci cylindrical, 75–80 × 7–8 mic.; 8-spored; spores mostly 1-seriate, elliptical to subfusoid, hyaline, 1-septate, 10–14 × 6 mic., usually not constricted.

On bark of various trees and shrubs, *Carya, Citrus, Hibiscus, Platanus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: S. Carolina to Florida and Louisiana.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 1–4.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2131, 2132;* Ravenel, Fungi Am. Exsicc. *285;* Other specimens examined: Florida, *Nash.*

2. SPHAEROSTILBE CINNABARINA (Mont.) Tul. Fung. Carp. 1: 130. 1861

Stilbum (*Atractium*) *cinnabarinum* Mont. Ann. Sci. Nat. II. 8: 360. 1837.

Stroma with a slender stalk 1–2 mm. long and a globose or clavate, red head; conidia nearly elliptical, straight or a little curved, 3–5 × 2 mic., granular within; perithecia few, surrounding the base of the stalked stroma, sessile, globose, smooth, orange, finally partially collapsed; asci clavate, about 80 × 13–16 mic.; spores 2-seriate, ovate, 22–26 × 7 mic., filled with numerous oil-drops.

On bark of trees and shrubs.

TYPE LOCALITY: Cuba.

DISTRIBUTION: S. Carolina to Mexico and Cuba.

EXSICCATI: Ellis & Everh. N. Am. Fungi *2133*. Other specimens examined: Cuba, *Wright;* Louisiana, *Langlois 168, 2179.*

The specimens examined did not show mature perithecia and measurements of asci and spores are from Saccardo. The conidial phase scarcely differs from *Sphaerostilbe gracilipes* Tul.

3. SPHAEROSTILBE FLAMMEA (Berk. & Rav.) Tul. Fung. Carp. 1: 130. 1861

Atractium flammeum Berk. & Rav.; Berk. & Broome, Ann. Mag. Nat. Hist. 13: 461. 1854.

Stilbum flammeum Tul. Ann. Sci. Nat. IV. 5: 114 (No. 757). 1856.

Stroma conical in form with the top finally becoming flattened; conidia fusiform, a little curved, 5–8-septate, about 60–75 × 5–7 mic.; perithecia nearly globose, bright red, smooth or only minutely rough, crowded on or near the base of the stroma; asci cylindrical, about 75–80 × 8–10 mic., 8-spored; spores 1-septate, elliptical to subfusoid, 1-septate, hyaline, 15 × 6–7 mic.

On bark of trees, *Acer, Crataegus, Salix.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Ontario to Louisiana and S. Carolina.

ILLUSTRATIONS: Tul. Fung. Carp. 3: *pl. 13, f. 10–13.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *3311.* Other specimens examined: Louisiana, *Langlois 2290;* N. Jersey, *Ellis;* Ontario, Canada, *Dearness.*

4. SPHAEROSTILBE COCCOPHILA (Desm.) Tul. Fung. Carp. 3: 105. 1865

Microcera coccophila Desm. Ann. Sci. Nat. III. 10: 359. 1848.

? *Nectria aurantiicola* Berk. & Br. Jour. Linn. Soc. 14: 117. 1875.

? *Nectria aglaeothele* Berk. & Curtis, Grevillea 4: 45. 1875.

Nectria subcoccinea Sacc. & Ellis, Michelia 2: 570. 1882.

Stroma consisting of a short, stout stalk with an orange head; conidia straight or more often curved, long, fusiform, 3–7-septate, 50–90 × 5–6 mic., occasionally shorter; perithecia more or less cespitose, bright orange, with a prominent, rather acute ostiolum; asci cylindrical, 75 × 8–10 mic., 8-spored; spores 1-seriate, elliptical or subelliptical, 12–18 × 7–9 mic.

On dead scale insects on bark, etc.

TYPE LOCALITY: France.

DISTRIBUTION: Florida to Alabama, Pennsylvania and the West Indies.

ILLUSTRATIONS: Fawcett, Bull. Fl. Agric. Exp. Sta. 94: *f. 2–3.*

EXSICCATI: Ellis, N. Am. Fungi, *1333;* Ravenel, Fungi Car. Exsicc. *57.* Other specimens examined: Florida, *Hume 39.*

The exsiccati cited are distributed under other names but both show the characteristic conidia and perithecia of the above species. Also both occur on scale insects.

13. MEGALONECTRIA Speg. An. Soc. Ci. Argent. 12: 82. 1881

Stroma consisting of a slender stalk with a globose head; perithecia globose or subglobose, bright colored, red or reddish, entire or collapsing, borne in cespitose clusters on or surrounding the base of the stroma; asci clavate, 8-spored; spores elliptical, many-septate, becoming muriform, hyaline.

Type species: *Sphaeria pseudotrichia* Schw.

Distinguished from *Sphaerostilbe* by the muriform spores.

1. MEGALONECTRIA PSEUDOTRICHIA (Schw.) Speg. An. Soc. Ci. Argent. 12: 82. 1881

Sphaeria pseudotrichia Schw.; Berk. & Curtis, Jour. Acad. Nat. Sci. Phil. II. 2: 289. 1853.

Nectria pseudotrichia Berk. & Curt. Jour. Acad. Nat. Sci. Phil. II. 2: 289. 1853.

Sphaerostible pseudotrichia Berk. & Broome, Jour. Linn. Soc. **14**: 114. 1875.

Stroma consisting of a slender stalk with a subglobose, reddish head; conidia 3–5 × 2 mic., hyaline; perithecia nearly globose, subcespitose, usually in or surrounding the base of the stroma, red, minutely rough, finally collapsing; asci clavate, very broad, 8-spored, 60–75 × 20–22 mic.; spores 2-seriate or irregularly crowded, large, 7–9-septate and muriform, yellowish-hyaline, 25–35 × 7–8 mic. (*pl. 13, f. 1–2*).

On bark, wood, etc.

TYPE LOCALITY: Surinam, S. America.

DISTRIBUTION: West Indies.

ILLUSTRATIONS: Berk. & Curtis, Jour. Acad. Nat. Sci. Phil. **2**: *pl. 25, f. 9.*

SPECIMENS EXAMINED: Cuba, *Murrill 156;* Jamaica, *Cockerell 37;* Porto Rico, *Heller 773, 775;* S. America, ex. Herb. *Schweinitz.*

DOUBTFUL SPECIES

Megalonectria caespitosa Speg. Bol. Acad. Nat. Cien. Corb. **11**: 541. 1889.

This species has been distinguished by the larger spores which range from 30–45 × 10–12. The only specimen examined is from the herbarium of Prof. Bessey and according to the label was found on wood supporting a south Mexican orchid in the greenhouse at Lincoln, Nebraska.

14! ALLANTONECTRIA Earle; Greene, Plantae Bakerianae **2**: 11. 1901

Nectriella Sacc. (in part).

Perithecia bright colored, red, occurring in cespitose clusters on a stroma as in *Creonectria;* asci cylindrical to clavate, 8-spored; spores allantoid, simple, hyaline.

Type species: *Allantonectria Yuccae* Earle.

Distinguished from *Creonectria* by the simple spores which in the type species are allantoid in form.

1. ALLANTONECTRIA YUCCAE Earle l. c.

Perithecia densely cespitose in clusters of 12–20, seated on a stroma; perithecial clusters erumpent, thickly scattered or sub-

confluent, averaging about 1 mm. in diameter; perithecia bright red becoming dull red with age, subglobose, smooth, or minutely roughened, partially collapsing when dry, 100–125 mic. in diameter; asci clavate or cylindrical, 8-spored; spores 2-seriate or irregularly crowded, allantoid, 4–5 × 1 mic.

On dead leaves of *Yucca* sp.

TYPE LOCALITY: Hermosa, Colorado.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Colorado, *Baker* (type).

This species scarcely differs from Rouméguere's Fungi Sel. Exsicc., *6860* and Saccardo's Mycotheca Ital. *866* so far as we can see, both of which are labeled *Nectriella miltina* (Mont.) Sacc. The species however is probably distinct from that species, in which the spores are described as ovoid.

15. **Sphaerodermatella** gen. nov.

Stroma erumpent, fleshy; perithecia in dense cespitose clusters seated on the stroma which is entirely obscured at maturity, more or less rough and furfuraceous; asci broad-clavate to ovoid, 4–8-spored; spores simple becoming dark colored and opaque.

Distinguished from *Sphaeroderma* by the absence of effuse stroma and the cespitose arrangement of the perithecia.

1. **Sphaerodermatella Helleri** (Earle)

Melanospora (*?*) *Helleri* Earle, Muhlenbergia 1: 13. 1901.

Sphaeroderma Helleri Sacc. & Sacc. Syll. Fung. 17: 781. 1905.

Stroma erumpent; perithecia superficial, densely cespitose, 3 or 4–20 on an indistinct basal stroma, large, .5–1 mm. in diameter, deeply collapsing, grayish externally from irregular, flat, finally deciduous, wart-like projections apparently formed by the cracking of the hard outer layer; substance of the perithecial wall of a dark brown color, soft, composed of small-celled parenchyma; ostiolum slightly prominent when young, perforation obscure when collapsed; asci oblong, about 100 × 30 mic., soon evanescent; 4–8-spored; spores 2-seriate, elliptical, simple, at first hyaline, finally opaque and black, surrounded with a more or less distinct hyaline coating about 25–28 × 12–20 mic.; expelled and blackening the matrix when mature; paraphyses indistinct.

On bark of tree.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Porto Rico, *Heller* (type).

16. **Creonectria** gen. nov.

Nectria Fries, Summa Veg. Scand. 387 (in part). 1849.

Stroma fleshy or subfleshy, tubercular or depressed, red, yellow, brown, or occasionally black (at least with age); perithecia globose or subglobose with the ostiolum often depressed with age, smooth, verrucose or furfuraceous, superficial on or surrounding the stroma; asci cylindrical, or clavate, 8-spored, with the spores occasionally accompanied by numerous other minute spore-like bodies in the ascus; spores 1–2-seriate or irregularly crowded, elliptical to fusoid, straight or curved, 1-septate, hyaline; paraphyses present or not evident.

Type species: *Tremella purpurea* L.

Distinguished from *Nectria* by the presence of a stroma. Conidial phase represented by *Tubercularia, Verticillium,* etc.

Perithecia some shade of red, scarlet, brick-red or brownish-black.
- Perithecia dull brick-red becoming brown or black with age.
  - Ascospores not accompanied by spore-like bodies in the ascus.
    - Perithecia verrucose, covered with coarse granules.
      - Stroma tubercular, prominent. — 1. *C. purpurea.*
      - Stroma concave, not rising above the surface of the substratum. — 2. *C. verrucosa.*
    - Perithecia smooth or only minutely rough, becoming black with age. — 3. *C. atrofusca.*
  - Ascospores accompanied by minute spore-like bodies in the ascus. — 4. *C. Coryli.*
- Perithecia scarlet or blood-red, becoming reddish-purple with age.
  - Spores elliptical or subelliptical with ends obtuse.
    - Perithecia collapsing with age.
      - Becoming truncate. — 5. *C. pithoides.*
      - Becoming pezizoid when collapsed. — 6. *C. rubicarpa.*
    - Perithecia entire; ostiolum very prominent. — 7. *C. mammoidea.*
  - Spores fusoid with ends acute or subacute.
    - Spores narrow-fusoid, 3 times as long as broad. — 8. *C. coccinea.*
    - Spores broad-fusoid, 2 times as long as broad.

Comparatively small, not more than 16 mic. long.
Perithecia vertically collapsing, on *Diatrypella*. 9. *C. nipigonensis.*
Perithecia mostly entire, on coniferous wood. 10. *C. Cucurbitula.*
Comparatively large, 20–25 mic. long. 11. *C. diploa.*
Perithecia pale rose-colored or some shade of yellow or yellowish-white.
Perithecia in cespitose clusters on the stroma.
Spores 10–14 × 3–3.5 mic.
Conidial phase profuse on decaying seeds. 12. *C. seminicola.*
Conidial phase consisting of isolated tubercular stromata. 13. *C. ochroleuca.*
Spores 12–14 × 5 mic. 14. *C. gramnicospora.*
Perithecia scattered over the surface of a tubercular stroma. 15. *C. tuberculariformis.*

1. **Creonectria purpurea** (L.)

Tremella purpurea L. Sp. Pl. **2**: 1158. 1753.
Sphaeria tremelloides Weigel. Obs. Bot. 46. 1772.
Tubercularia vulgaris Tode, Fungi Meckl. **1**: 18. 1790.
Sphaeria cinnabarina Tode, Fungi Meckl. **2**: 9. 1791.
Cucurbitaria cinnabarina Greville, Scot. Fl. Crypt. **3**: 136. 1825.
Nectria cinnabarina Fries, Summa Veg. Scand. 388. 1849.
Nectria Sambuci Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 246. 1891.
Nectria Meliae Earle, Bull. Torrey Club **25**: 364. 1898.
Nectria Russellii Berk. & Broome, Grevillea **4**: 45.
Nectria offuscata Berk. & Curtis, Grevillea **4**: 45.
Nectria nigrescens Cooke, Grevillea **7**: 50.
Sphaeria dematiosa Schw. Trans. Am. Phil. Soc. II. **4**: 205. 1832.
Sphaeria Celastri Schw.; Fries, El. Fung. **2**: 81. 1827.
Nectria purpurea (L.) Wilson & Seaver, Jour. Myc. **13**: 51. 1907.

Stroma erumpent, tubercular, at first pinkish or yellowish-red becoming darker with age, often brownish and occasionally quite black, 1–2 mm. in diameter and 1–2 mm. high; conidiophores 50–100 mic. long with short lateral branches on which the conidia are borne; conidia 4–6 × 2 mic., elliptical, hyaline; perithecia

springing at first from the base of the stroma which at maturity is concealed by the cespitose clusters of perithecia; individual perithecia nearly globose with the ostiolum rather prominent, becoming slightly collapsed, at first bright, cinnabar-red, becoming darker with age, often brown and occasionally black (when weathered); roughened externally with coarse granules 375–400 mic. in diameter; asci clavate, 8-spored, 50–90 × 7–12 mic.; spores mostly 2-seriate, elliptical, elongated, about 3 times as long as broad with the ends obtuse, 1-septate, hyaline, mostly a little curved, 12–20 × 4–6 mic.; paraphyses very delicate.

On bark of various kinds of deciduous trees and shrubs; *Acer, Amorpha, Ampelopsis, Berberis, Carya, Calycanthus, Celastrus, Cornus, Euonymus, Melia, Morus, Populus, Prunus, Pyrus, Quercus, Rhus, Ribes, Robinia, Rubus, Sambucus, Tilia, Ulmus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Maine to California and from Ontario to S. Carolina, probably common throughout N. America.

ILLUSTRATIONS: Tode, Fungi Meckl. *pl. 9, f. 68;* Tulasne, Fung. Carp. 3: *pl. 12;* E. & P. Nat. Pfl. Fam. 1[1]: *f. 239,* A–D.; Winter, Rabenh. Krypt. Fl. 1[2]: 87. *f. 1–3.*

EXSICCATI: Ellis, Fungi Nova Caesareenses, *68;* Ellis, N. Am. Fungi, *468;* Ellis & Everhart, Fungi Columbiani, *115;* Bartholomew, Fungi Columbiani, *2334, 2847*; Ravenel, Fungi Am. Exsicc. *339, 4119.*

Other specimens examined: Types or cotypes of the following synonyms have been examined: *Nectria Sambuci* Ellis & Everh., *Nectria Meliae* Earle, *Nectria Russellii* Berk. & Broome, *Nectria offuscata* Berk. & Curtis, *Nectria nigrescens* Cooke, *Sphaeria dematiosa* Schw., and *Sphaeria Celastri* Schw.

This is probably the most common and widely distributed species of the entire order and since it is very variable has been many times redescribed.

2. **Creonectria verrucosa** (Schw.)

Sphaeria verrucosa Schw. Trans. Am. Phil. Soc. II. 4: 204. 1832.

Nectria verrucosa Sacc. Syll. Fung. 2: 509. 1883.

Stroma fleshy, concave or convex, scarcely rising above the surface of the substratum; perithecia cespitose in clusters 1–2 mm. in diameter, erumpent through the outer bark; individual

perithecia nearly globose, dull red, very rough externally with coarse granules, 250–300 mic. in diameter; asci cylindrical to clavate, 8-spored, 50–65 × 5–6 mic.; spores 2-seriate, 1-septate, elliptical, with ends obtuse, straight or a little curved, usually not constricted, 12–16 × 4 mic.

On dead branches of *Morus, Sassafras* and *Melia.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Delaware to N. Dakota and Alabama.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 13–19.*

EXSICCATI: Ellis & Everhart, N. Am. Fungi, *2371.* Other specimens examined: Alabama, *Little;* Connecticut, *Thaxter;* Delaware, *Commons;* N. Jersey, *Ellis;* N. Dakota, *Seaver;* Pennsylvania, *Schweinitz* (type); S. Carolina, *Ravenel.*

Distinguished from *C. purpurea* (L.) Seaver only by the depressed stroma.

3. **Creonectria atrofusca** (Schw.)

Sphaeria atrofusca Schw. Trans. Am. Phil. Soc. II. 4: 206. 1832.
Nectria atrofusca Ellis & Everh. Jour. Myc. 1: 140. 1885.

Stroma fleshy or subfleshy, rather dark colored, erumpent but not rising much above the surface of the bark; perithecia in cespitose clusters on the stroma, clusters variable in size, averaging 1–2 mm., dark colored, nearly black in dried specimens, brownish-black with transmitted light, small mostly less than 200 mic. in diameter, subglobose with a prominent papilliform ostiolum, mostly collapsing when dry; asci subcylindrical, 45–50 × 7 mic., 8-spored; spores partially 2-seriate above, 1-seriate below, hyaline, 1-septate, slightly constricted at the septum, subfusoid with the ends slightly narrowed.

On dead branches of *Staphylea trifolia.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Pennsylvania.

EXSICCATI: Ellis, N. Am. Fungi, *1547.* Other specimens examined: Pennsylvania, *Schweinitz* (type).

The species is distinguished by its host as well as the very dark colored perithecia.

4. **Creonectria Coryli** (Fuckel)

Nectria Coryli Fuckel, Symb. Myc. 180. 1869.
Chilonectria Coryli Ellis & Everh. N. Am. Pyrenom. 116. 1892.

Perithecia cespitose on an erumpent stroma, globose, smooth, at first bright red becoming blackish, entirely black in weathered specimens, collapsing becoming pezizoid; asci clavate, 85–100 × 10–12 mic., 8-spored but with spores often obscured by numerous, allantoid spore-like bodies which are present in the ascus; spores fusoid, 1-septate, with a short curved appendage at each end, 10–15 × 2.5–3 mic.

On branches of deciduous trees and shrubs; *Betula, Corylus, Crataegus, Lonicera, Populus, Rhus, Salix, Symphoricarpus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to Ontario and N. Dakota.

EXSICCATI: Ellis, N. Am. Fungi, *159*. Other specimens examined: Delaware, *Commons;* New Jersey, *Ellis;* N. Dakota, *Brenckle;* Ontario, Canada, *Dearness.*

The species is very distinct in its spore characters.

5. **Creonectria pithoides** (Ellis & Everh.)

Nectria pithoides Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 247. 1891.

Stroma erumpent, yellowish; perithecia seated on the stroma in dense clusters 1.5–2.5 mm. in diameter, individual perithecia bright red, collapsing so as to become truncate, resembling the head of a barrel with the ostiolum appearing as a light translucent dot in the center, 200–250 mic. in diameter; asci cylindrival, 70–80 × 5 mic., 8-spored; spores elliptical, 1-septate, with an oil-drop in each cell, hyaline, 6–10 × 3–4 mic. (*pl. 13, f. 3–4*).

On bark of dead alders.

TYPE LOCALITY: British Columbia.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2750* (cotype).

Distinguished by the bright red perithecia which are decidedly barrel-shaped when dry.

6. **Creonectria rubicarpa** (Cooke)

Nectria rubicarpa Cooke, Grevillea **7**: 50. 1878.

Perithecia cespitose in small, dense clusters, 1–2 mm. in diameter, minutely roughened, bright red becoming darker with age, collapsing and becoming deeply pezizoid; asci cylindrical to clavate, 55–60 × 6 mic., 8-spored; spores 1-seriate or partially 2-seriate above; elliptical, hyaline, 1-septate, 10–13 × 4–4.5 mic. scarcely constricted (*pl. 13, f. 11–12*).

On dead limbs of *Gelsemium* and stems of *Ilex*.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: New Jersey to Alabama.

EXSICCATI: Ellis, N. Am. Fungi, *80;* Ravenel, Fungi Am. Exsicc. *341*. Other specimens examined: Alabama, *Earle;* New Jersey, *Ellis*.

The species is distinguished by the dense clusters of collapsing perithecia and the small size of the spores.

7. **Creonectria mammoidea** (Phil. & Plow.)

Nectria mammoidea Phil. & Plow. Grevillea 3: 126. 1875.

Perithecia cespitose in clusters 1–3 mm. in diameter or more or less scattered, surrounding a brownish stroma, very large, averaging about 500 mic. in diameter, ovate, tapering above into a large, obtuse ostiolum, bright red with ostiolum often darker, shining, entire; asci cylindrical or slightly clavate, 100 × 7–8 mic., 8-spored; spores 1-seriate or partially 2-seriate above, oblique, subfusoid, 1-septate, usually slightly unequal-sided, 18–20 × 6–7 mic.

On wood and bark.

TYPE LOCALITY: England.

DISTRIBUTION: New Jersey to Ontario.

ILLUSTRATIONS: Grevillea 3: *pl. 42, f. 5*.

SPECIMENS EXAMINED: New Jersey, *Ellis;* Ontario, *Macoun;* also specimens from the herbarium of *Plowright*.

8. **Creonectria coccinea** (Pers.)

? *Sphaeria decidua* Tode, Fungi Meckl. 2: 31. 1791.

Sphaeria coccinea Pers. Ic. et Descr. 2: 47. 1800.

Nectria coccinea Fries, Summa Veg. Scand. 388. 1849.

Stroma yellowish, springing from the crevices of bark in irregular patches; perithecia cespitose in dense irregular clusters often several mm. in diameter, or occasionally scattered around the stroma; individual perithecia ovate with a prominent ostiolum, bright red, almost scarlet, color somewhat variable, smooth or very minutely roughened, mostly entire, about 300 mic. in diameter; asci cylindrical or clavate, 8-spored, 80–90 × 8–10 mic.; spores 1-seriate, fusoid, 12–16 × 4–5 mic.

On bark or more rarely on decorticated wood, *Acer, Fagus, Fraxinus, Magnolia, Melia, Ulmus,* etc.

TYPE LOCALITY: Europe.

DISTRIBUTION: Vermont to N. Dakota and W. Virginia, probably extending over a much wider range.

ILLUSTRATIONS: Pers. Ic. & Descr., *pl. 12, f. 2.*

EXSICCATI: Ellis, N. Am. Fungi, *161;* Ellis & Everh. N. Am. Fungi, *618;* E. Barholomew, Fungi Columbiani, *2043, 2238.* Other specimens examined: New York, *Clinton, Seaver;* N. Dakota, *Seaver;* N. Jersey, *Ellis;* Ontario, Canada, *Dearness;* Vermont, *Burt, Orton;* W. Virginia, *Orton.*

So far as we can see the species scarcely differs from *Nectria ditissima* Tul. If the two species are distinct, the characters are so poorly understood that they have been badly confused. The specimens examined which have been referred to these two names are identical.

9. **Creonectria nipigonensis** (Ellis & Everh.)

Nectria nipigonensis Ellis & Everh. Proc. Acad. Nat. Sci. Phil. 1893: 129. 1893.

Stroma depressed, yellowish, about .5 mm. in diameter; conidia minute, allantoid, 3–4 × 1 mic.; perithecia cespitose, nearly globose, about 250 mic. in diameter, reddish becoming darker with age, finally collapsing at the apex, smooth; asci cylindrical, 8-spored, 50–55 × 6–7 mic.; spores 1-seriate, fusoid or occasionally subelliptical, 1-septate, usually not constricted at the septum.

On the erumpent disc of *Diatrypella.*

TYPE LOCALITY: Lake Nipigon, Canada.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Canada, *Macoun* (type).

Distinguished by the pezizoid perithecia and broad-fusoid spores.

10. **Creonectria Cucurbitula** (Sacc.)

Nectria Cucurbitula Sacc. Michelia 1: 409. 1878. Not *N. Cucurbitula* (Tode) Fr.

Perithecial clusters erumpent and often very irregular in form, 1–2 mm. in diameter, consisting of numerous densely cespitose perithecia; individual perithecia bright red later becoming reddish-purple, ovate with a prominent rather obtuse ostiolum, entire or very rarely collapsing; asci cylindrical or clavate, 75–100 × 6–8 mic., 8-spored; spores at first crowded and partially 2-seriate, finally becoming 1-seriate, obliquely arranged with ends over-

lapping, broad-fusoid, rarely subelliptical, 1-septate and not constricted at the septum, hyaline, 14–16 × 5–7 mic. (mostly 15 × 7 mic.).

On bark of *Pinus, Abies* and *Larix*.

TYPE LOCALITY: Europe.

DISTRIBUTION: Newfoundland to New York and Ontario.

SPECIMENS EXAMINED: Newfoundland, *Waghorne;* New York, *Peck;* Ontario, Canada, *Macoun.*

The species is distinct both in external and internal characters.

11. **Creonectria diploa** (Berk. & Curtis)

Nectria diploa Berk. & Curtis, Jour. Linn. Soc. **10**: 378. 1869.

Perithecia in dense erumpent clusters about .5 mm. in diameter, individual perithecia minute, ovate, nearly smooth, bright red, finally collapsing; asci cylindrical, 8-spored; spores vertically 2-seriate, very large, fusoid, 1-septate, hyaline, with 2–4 oil-drops, 20–25 × 7–10 mic.

On bark of *Alnus* sp.

TYPE LOCALITY: S. Carolina.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ravenel, Fungi Car. Exsicc. *55.*

Individual perithecia resemble those of *Nectria episphaeria* (Tode) Fries but differ in the very large size of the spores. The dense clusters of perithecia seem to indicate the presence of a stroma although the specimens are too old to show any definite stroma.

12. **Creonectria ochroleuca** (Schw.)

Sphaeria ochroleuca Schw. Trans. Am. Phil. Soc. II. **4**: 204. 1832.

Nectria ochroleuca Berk. Grevillea **4**: 16. 1875.

Nectria aureofulva Cooke & Ellis, Grevillea **7**: 8. 1878.

Nectria depauperata Cooke, Grevillea **7**: 50. 1878.

Nectria vulgaris Speg. Anal. Soc. Ci. Arg. **12**: 75. 1881.

Verticillium tubercularioide Speg. Anal. Soc. Ci. Arg. **12**: 125. 1881.

? *Nectria rhizogena* Grevillea **11**: 108. 1883.

Nectria pallida Ellis & Everh. Proc. Phil. Acad. Nat. Sci. **1894**: 325. 1894.

Stromata small, tubercular, 1–2 mm. in diameter, whitish to pink or flesh-colored, often floccose with the erect verticillate conidiophores; branches of the conidiophores ascending perpendicularly and each bearing at its summit a single conidium; conidia elliptical, hyaline, 5–8 × 3 mic. often granular within; perithecia occurring in dense clusters ranging from 3–5 to many perithecia, clusters very variable in form; individual perithecia small, nearly globose with the prominent papilliform ostiolum, smooth or only minutely rough, at first flesh-colored, when dry becoming pale yellow or almost white, 200–300 mic. in diameter, entire or occasionally collapsing becoming pezizoid; asci clavate, 8-spored, 50 × 5–7 mic.; spores 2-seriate above, 1-seriate below or often irregularly crowded, fusoid with ends acute, a little constricted at the septum, hyaline, 8–12 × 3–4 mic.

On bark of various kinds of trees, *Andromeda, Betula, Carpinus, Carya, Clethra, Citrus, Laurus, Magnolia, Platanus, Salix,* also on *Yucca* and old stump of *Musa.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: New York to Missouri and Louisiana.

EXSICCATI: Ellis, N. Am. Fungi, *677, 574.* Ravenel, Fungi Am. Exsicc. *645.* Other specimens examined: Delaware, *Commons;* Missouri, *Demetrio* (type of *N. pallida* Ellis & Everh.); New York, *Seaver, Shear;* Pennsylvania, *Schweinitz* (type of *Sphaeria ochroleuca* Schw.); also cotype of *N. aureofulva* Cooke & Ellis, specimens of *N. depauperata* determined by M. C. Cooke, and specimens of *N. vulgaris* Speg. and *Verticillium tuberculariodide* Speg. both from the herbarium of Spegazzini.

The species seems to be very common in the east and south and has been collected by the writer on several kinds of trees and shrubs about New York City. The perithecial clusters are quite variable in size and form and the perithecia themselves variable in color but the species may usually be recognized by the pale perithecia and small, fusoid spores.

13. **Creonectria seminicola** (Seaver)

Nectria seminicola Seaver, Mycologia 1: 21. 1909.

Conidial phase consisting of white mycelial growth covering the substratum, finally heaping up at various points forming pinkish stromata; conidiophores erect, much branched with branches ascending perpendicularly, each bearing at its summit a single elliptical, hyaline, conidium; conidia 5–7 × 2–3 mic., with 1–2 oil-

drops; perithecia cespitose in dense clusters with the clusters often becoming confluent and covering the most of the exposed surface of the substratum; individual perithecia nearly globose with a minute papilliform ostiolum, smooth or nearly so, 250 mic. in diameter, at first flesh-colored to orange, fading in drying to pale yellow or whitish; asci clavate, 40–50 mic. long, 8-spored; spores mostly 2-seriate or irregularly crowded, hyaline, 1-septate, a little constricted at the septum, 10–14 × 3–3.5 mic. (*pl. 13, f. 5–7*).

On partially decayed seeds of skunk cabbage, ***Spathyema foetida*** and also on seeds of cultivated beans which are partially decayed.

TYPE LOCALITY: New York City.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Mycologia 1: *pl. 2, f. 5–9.*

SPECIMENS EXAMINED: New York, *Seaver* (type).

The perithecial and spore characters of this species are identical with those of the preceding with which specimens were carefully compared before describing the species originally. Since describing the present species other information gained in the field has suggested that possibly the two are identical. Attempts to prove the identity of the two species by culture have failed.

14. **Creonectria gramnicospora** (Ferd. & Wge.)

Nectria grammicospora Ferd. & Wge. Bot. Tidsskrift **29**: 11. 1908.

Stromata pulvinate, erumpent; perithecia cespitose, clusters variable in size; individual perithecia subglobose, 300–350 × 200–250 mic. in diameter, fleshy-membranaceous, pallid-ochraceous, slightly white furfuraceous near the base; asci clavate, above truncate, subsessile, 35–60 × 8.5–10 mic., 8-spored; spores 2-seriate above, 1-seriate below, ellipsoid, slightly unequal-sided, 12–14 × 5 mic.

On bark of branches.

TYPE LOCALITY: Island of St. Thomas.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Bot. Tidssk. **29**: *pl. 1, f. 3.*

SPECIMENS EXAMINED: St. Thomas, Raunkier *3103* (cotype).

Similar in general appearance to the two preceding species but spores larger with some differences in size of perithecia and other gross characters.

15. **Creonectria tuberculariformis** (Rehm)

Hypocrea tuberculariformis Rehm, Ber. Naturh. Ver. Augsburg **26**: 106. 1881.

Nectria tuberculariformis Winter; Rabenh. Krypt. Fl. 1^2: 118. 1887.

Hypocreopsis tuberculariformis Sacc. Syll. Fung. 9: 981. 1891.

Stroma tubercular, rounded or more often elongated, nearly smooth or in dried specimens often longitudinally striated, pinkish or rose-colored becoming dull red with age; perithecia superficial, solitary or more or less crowded, small, averaging about 200 mic. in diameter, smooth or nearly so, globose with a rather prominent papilliform ostiolum becoming slightly collapsed from above when dry; asci clavate, 8-spored, 40–50 × 6–7 mic.; spores 1–2-seriate, mostly 2-seriate above and 1-seriate below, usually a little broader above, fusoid, 1-septate and a little constricted at the septum, with small oil-drops in each cell, 8–11 × 3–4 mic. (*pl. 13, f. 8–10*).

On dead stems of *Urtica* sp., more rarely on old branches and dung.

TYPE LOCALITY: Germany.

DISTRIBUTION: N. Dakota.

SPECIMENS EXAMINED: N. Dakota, *Seaver* (various collections); also Rehm, Ascomycetes, *435, 679* (including cotype).

The conidial phase of this fungus was collected commonly in North Dakota but the mature perithecia were less common. The species is very different in the arrangement of the perithecia from any of the other species of the genus.

DOUBTFUL SPECIES

Nectria muscivora (Berk. & Br.) Cooke, Handbk. Brit. Fungi **2**: 786. 1871.

Sphaeria muscivora Berk. & Br. Ann. Mag. Nat. Hist. **6**: 188. 1851. *Calonectria muscivora* Sacc. Michelia **1**: 315. 1878.

"Mycelium forming white, lanose patches 2 inches or more in diameter and rapidly destroying the moss on which it grows. Perithecia collected in little groups more or less connate, half immersed in the mycelium, bright orange, ovate, sometimes collapsing laterally, orifice papillaeform. Asci clavate; sporidia elliptical, pointed at either end, with a central septum, and the endochrome in either articulation bipartite, so that they are probably three-septate when the sporidia are quite mature."

Specimens distributed in Ravenel's Fungi Car Exsic. 57 and Ellis' N. Am. Fungi 1333, both of which have been incorrectly referred to this name, are apparently good specimens of *Sphaerostilbe coccophila* (Desm.) Tul. The type of the present species has not been seen.

Nectria infusaria Cooke & Hark. Grevillea **12**: 101. 1884.

Stroma (*Fusarium*) pulvinate, pale red; conidia curved, 3-septate, hyaline, 30–40 × 2.5 mic.; perithecia cespitose, erumpent, pallid-red, few in number, soft-membranaceous, subconfluent, smooth, 5–10 on a stroma; asci cylindrical, 8-spored; spores 1-seriate, elliptical, 1-septate, not constricted, hyaline, 10 × 4–5 mic.

On *Acacia* twigs, California. No specimen has been seen.

Nectria Ipomoeae Halst. Rep. N. Jersey Agric. Exp. Sta. **12**: 281. 1891.

Conidial phase consisting of a *Fusarium;* perithecia cespitose, globose-conical, verrucose-squamulose, red; asci clavate, 8-spored; spores elliptical, 1-septate, slightly constricted, hyaline.

On roots and stems of eggplant.

A note from Mr. Halsted states that the type of this species was probably destroyed. The species seems to be well characterized although no specimens in good condition have been available for examination.

Nectria Bainii Massee, Bull. Royal Gardens Kew 1899: 5. 1901.

Perithecia gregarious, seated on a yellowish-red or orange-colored mycelium, globose, red, hairy, finally naked above, 300–350 mic. in diameter; asci clavate-cylindrical, shortly stipitate, 8-spored, 80–90 × 7–9 mic.; spores partially 2-seriate, oblong-elliptical or subacute, 1-septate, 10–12 × 5 mic., hyaline.

Parasitic on cacao pods, Trinidad.

A cotype specimen of this species from Kew is too minute to permit fair examination.

Nectria ditissima Tul. Fung. Carp. **3**: 73. 1865.

American specimens referred to this name do not differ so far as we can see from *Nectria coccinea* (Pers.) Fries.

Nectria citisporina Ellis & Everh. Erythea **1**: 197. 1893.

Nectria microspora Cooke & Ellis, Grevillea **5**: 53. 1876.

17. **Macbridella** gen. nov.

Perithecia in dense cespitose clusters seated on a stroma, bright colored, reddish or yellowish, becoming darker with age, globose to subcylindrical, collapsing or entire; asci cylindrical-clavate, 8-spored; spores elliptical or fusoid, 1-septate, at first hyaline, becoming smoky-brown to brownish-black.

Type species: *Nectria chaetostroma* Ellis & Macbr.

Distinguished from *Creonectria* by the colored spores. The subgeneric name *Phaeonectria* was proposed by Saccardo and based on one of the species here described. Since both of the North American species included in this genus were collected on a botanical expedition sent out from the State University of Iowa, both were originally described in the Bulletin of the Laboratories of Natural History of that Institution, and the type of the genus bears the name of Professor T. H. Macbride as its coauthor, it seems appropriate that the genus should be named in his honor.

Spores small, 18–20 × 7–8.5 mic.; perithecia surrounded with hairs.	1. *M. chaetostroma.*
Spores large, 35–48 × 10–12 mic.; perithecia not surrounded with hairs.	2. *M. striispora*

1. **Macbridella chaetostroma** (Ellis & Macbr.)

Nectria chaetostroma Ellis & Macbr.; Ellis & Everh.; Bull. Lab. Nat. Hist. St. Univ. Iowa **4**: 70. 1896.

Perithecia in dense irregular clusters 1–5 mm. in diameter, clusters often elongated; individual perithecia globose or subglobose, dark reddish-brown, becoming brownish-black, slightly collapsing becoming pezizoid, surrounded at the base with a growth of brown, crooked, septate hairs, 100–200 mic. long and 3–4 mic. thick; asci clavate, 75–80 × 10 mic., 8-spored; spores 2-seriate or rather irregularly crowded in the ascus, elliptical, straight or curved, 1-septate, slightly constricted, with a distinct oil-drop in each cell, pale brown, 18–20 × 7–8.5 mic.; paraphyses filiform.

On bark of undetermined tree or shrub.

TYPE LOCALITY: Central America.

DISTRIBUTION: Known only from type locality.

EXSICCATI: C. L. Smith, Nicaragua Fungi, *206* (cotype).

"The first appearance is a tuft of dark brown hairs, which are finally hidden and almost obliterated by the densely crowded perithecia 10–40 in number in a compact group 1–4 mm. across."

2. **Macbridella striispora** (Ellis & Everh.)

Nectria striispora, Ellis & Everh. Bull. Lab. Nat. Hist. St. Univ. Iowa **2**: 398. 1893.

Perithecia in irregular, dense, cespitose clusters as large as 5 mm. in diameter, consisting of 20–100 perithecia each; individual perithecia subcylindrical, tapering above into an obtuse ostiolum which in mature specimens is quite prominent, at first covered with a yellowish furfuraceous coat, finally amber; asci clavate, tapering above, about 100 × 15 mic., 8-spored; spores crowded in the ascus, large, fusoid, straight or curved, 1-septate, with several large oil-drops in each cell, slightly constricted at the septum, pale brown, becoming striated, 35–48 × 10–12 mic.; paraphyses indistinct.

On bark and rotten wood.

TYPE LOCALITY: Central America.

DISTRIBUTION: Known only from type locality.

EXSICCATI: C. L. Smith, Central Am. Fungi, *6.*

The spores in this species resemble in size and color the teleutospores in some of the common rusts. The striations are quite prominent but do not appear to roughen the outer surface but to be due to some internal markings or contents.

18. GIBBERELLA Sacc: Michelia **1**: 43 (in note). 1879

Stromata (*Fusarium*) tubercular or more or less effuse; perithecia cespitose or occasionally scattered on or surrounding the stromata; asci clavate, 8-spored, spores fusoid; 3–many-septate, hyaline.

Type species: *Sphaeria pulicaris* Fries.

1. GIBBERELLA PULICARIS (Fries); Sacc. Michelia **1**: 43 (in note). 1879

Sphaeria pulicaris Fries; Kunze & Schm. Myk. Hefte **2**: 37. 1823.

Gibbera pulicaris Fries, Summa Veg. Scand. 402. 1849.

Botryosphaeria pulicaris Ces. & Not. Comm. Soc. Critt. It. **1**: 212. 1863.

Perithecia in cespitose clusters .5–1 mm. in diameter, seated on a stroma or occasionally more or less scattered around it, ovate with a rather prominent ostiolum, minutely rough, finally collapsing, black to the unaided eye, blue with transmitted light; asci

clavate, tapering above, 8-spored, 50–55 × 10 mic.; spores crowded in the ascus, fusiform, straight or curved, 3-septate, hyaline or slightly yellowish, 18–20 × 5–6 mic.

On corn stalks, herbaceous stems and bark of trees and shrubs.

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to N. Dakota, Kansas and W. Virginia.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 13, f. 1–6;* E. & P. Nat. Pfl. Fam. *f. 240,* G–J.

EXSICCATI: Ellis, N. Am. Fungi, *81;* Wilson & Seaver, Ascom. & Lower Fungi, *32.* Other specimens examined: N. Jersey, *Ellis, Commons;* W. Virginia, *Nuttall;* Iowa, *Seaver;* N. Dakota, *Seaver.*

DOUBTFUL SPECIES

Gibberella Saubinetii (Durien & Mont.) Sacc. Michelia 1: 513. *Sphaeria Saubinetii* Durien & Mont.; Durien; U. Alger. Crypt. 1: 479. 1846? *Gibbera Saubinetii* Mont. Syll. Crypt. 252. 1856.

Gibberella ficini (Cooke & Hark.) Ellis & Everh. N. Am. Pyrenom. 120. 1892.

19. **Scoleconectria** gen. nov.

Ophionectria Sacc. (in part).

Stroma subglobose, tubercular or depressed; perithecia superficial on or surrounding the stroma, in dense clusters or more or less evenly scattered; asci 2–8-spored, cylindrical to clavate; spores 3–many-septate, fusoid to subfiliform, hyaline, or subhyaline.

Type species: *Ophionectria scolecospora* Bref.

Distinguished from *Creonectria* by the many-septate spores and from *Ophionectria* by the presence of a stroma. Characterized by its worm-like spores.

Spores filiform or subfiliform, very long.	
On dead branches of *Pinus;* spores 40–50 × 2.5–3 mic.	1. *S. scolecospora.*
On scale insects; spores clavate, 100–120 × 6–7 mic.	2. *S. coccicola.*
Spores fusoid or subelliptical, comparatively short.	
Stroma prominent, tubercular, 1–2 mm. high.	3. *S. canadensis.*
Stroma depressed, inconspicuous.	
Spores subelliptical, curved.	4. *S. polythalama.*

Spores fusiform or subfusiform.	
Perithecia red; ascospores accompanied by smaller spore-like bodies.	5. *S. balsamea.*
Perithecia yellowish to brownish; spore-like bodies absent.	6. *S. Atkinsonii.*

1. **Scoleconectria scolecospora** (Bref.)

? *Nectria cylindrospora* Sollm. Bot. Zeit. **22**: 265. 1864.
Ophionectria scolecospora Bref. Unters. Myk. **10**: 178. 1891.
Chilonectria Cucurbitula Ellis & Everh. N. Am. Pyrenom. 116. 1892.

Perithecial clusters quite regular, rounded, composed of numerous, densely cespitose perithecia; individual perithecia dull red at first slightly furfuraceous, becoming quite smooth, nearly globose, finally collapsing becoming pezizoid; asci clavate to cylindrical, 60–75 × 8–10 mic., filled with numerous spore-like bodies, often obscuring the long cylindrical spores; spores usually more or less curved, many-septate with the septa transverse or extending irregularly, delicate, 40–50 × 2.5–3 mic.

On branches of different species of *Pinus*.

TYPE LOCALITY: Germany.

DISTRIBUTION: New Jersey.

ILLUSTRATIONS: Brefeld, Unters. Myk. **10**: *pl. 5, f. 45;* Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 9–12;* E. & P. Nat. Pfl. Fam. 1^1: *f. 241,* D.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *1551.*

Distinguished by the long cylindrical spores with the accompanying minute spore-like bodies. The species cannot be distinguished on gross characters.

No type specimen of this species has been examined but the description and illustration by Brefeld leave little doubt as to its identity. The species has been confused with other species occurring on the same habitat and with similar gross characters.

2. **Scoleconectria coccicola** (Ellis & Everh.)

Nectria coccicola Ellis & Everh. Jour. Myc. **2**: 39. 1886.
Dialonectria coccicola Ellis & Everh. Jour. Myc. **2**: 137. 1886.
Ophionectria coccicola Berl. & Vog.; Sacc. Syll. Add. **4**: 218. 1886.

Stroma rounded, more or less prominent, whitish; conidia borne in clusters of 3–5, large, broad at the base, tapering into a bristle-like apex, 15–20-septate, 100–150 × 7–7.5 mic. with a distinct stem-like base; perithecia in cespitose clusters, nearly globose or a little longer than broad, reddish becoming dark brownish, minutely roughened, at first clothed with a few hyaline hairs, then naked, 300–500 mic. in diameter; asci cylindrical, tapering below into a stem-like base, 150–200 × 20 mic.; spores clavate or subcylindrical, 100–120 × 6–7 mic. at the base, 15–20-septate, hyaline.

On dead scale insects on the bark of living orange trees.

TYPE LOCALITY: Florida.

DISTRIBUTION: Florida and Cuba.

ILLUSTRATIONS: Bull. Fl. Agric. Exp. Sta. **94**: 12, *f. 8–14.*

SPECIMENS EXAMINED: Florida, *Southworth* (type).

The conidia of this species resemble very closely both in size and form the ascospores but are much more acutely pointed and may also be distinguished by the manner in which they are borne.

3. **Scoleconectria canadensis** (Ellis & Everh.)

Nectria canadensis Ellis & Everh. Bull. Torrey Club **11**: 74. 1884.

Calonectria canadensis Berl. & Vog.; Sacc. Syll. Fung. Add. 212. 1886.

Stroma (*Tubercularia*) 1–2 mm. high, with an orange head and dull red base; conidia minute, elliptical, hyaline, about 5 × 2 mic.; perithecia springing in dense clusters from the base of the stroma, finally surrounding and often covering it; individual perithecia nearly globose, brick-red, 250–300 mic. in diameter, at first tubercular and rough finally becoming more or less smooth and slightly collapsing; asci clavate, 75–100 × 12–15 mic., 8-spored; spores crowded, elliptical, straight or curved, hyaline, 3-septate, 18–20 × 7 mic. (*pl. 13, f. 13–14*).

On the bark of *Ulmus* sp.

TYPE LOCALITY: Ontario, Canada.

DISTRIBUTION: Reported only from type locality.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 13, f. 7–14.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2547;* Ellis & Everh. Fungi Columbiani, *226.* Other specimens examined: Ontario, Canada, *Dearness,* various collections.

The species is distinct in its prominent stroma.

4. **Scoleconectria polythalama** (Berk.)

Nectria polythalama Berk.; Hooker's Fl. N. Zealand **2**: 203. 1853.

Nectria auriger Berk. & Rav. Grevillea **4**: 46. 1875.

Calonectria polythalama Sacc. Michelia **1**: 308. 1878.

Perithecia erumpent in dense clusters 1–2 mm. long and about 1 mm. broad; seated on a yellowish stroma; individual perithecia subglobose, at first covered with a yellowish-green coat of powdery material which finally disappears leaving the perithecia of a dull red color, finally collapsing; asci cylindrical or clavate, 50–60 × 12–15 mic., 8-spored; spores crowded, elliptical, curved, yellowish-hyaline, 7-septate (mostly), 18–22 × 5 mic.

On *Chionanthus, Fraxinus* and *Liquidambar.*

TYPE LOCALITY: New Zealand.

DISTRIBUTION: Virginia to Alabama.

ILLUSTRATIONS: Brekeley, Hooker's Fl. N. Zealand **2**: *pl. 116, f. 15.*

EXSICCATI: Ellis, Fungi Nova Caesareenses, *69;* Ellis, N. Am. Fungi, *79;* Ravenel, Fungi Car. Exsicc. *54, 60.* Other specimens examined: Virginia, *Commons.*

The perithecia are greenish in some specimens and reddish in others, the difference in color being due to the presence or absence of the greenish powdery material with which the perithecia are clothed. This difference in color seems to have been the distinguishing character of the two species, *N. polythalama* Berk. and *N. auriger* Berk. & Rav.

5. **Scoleconectria balsamea** (Cooke & Peck)

Nectria balsamea Cooke & Peck, Ann. Rep. N. Y. State Mus. **26**: 84. 1874. Grevillea **12**: 81. 1884.

? *Calonectria Cucurbitula* Sacc. Michelia **1**: 312. 1878.

Calonectria balsamea Sacc. Syll. Fung. **9**: 986. 1891.

Perithecial clusters small, 1–2 mm. in diameter, erumpent through the outer bark; individual perithecia nearly globose smooth or only minutely rough, red; in dried specimens dull brick-red, entirely collapsing, becoming pezizoid; asci cylindrical to clavate, at first filled with numerous minute, spore-like bodies about 2 × 1 mic. among which are several (2–4) true spores; spores fusiform, 5–6-septate, granular within, 15–25 × 4–5 mic.

On the branches of *Abies balsamea.*

TYPE LOCALITY: North Elba, New York.

DISTRIBUTION: New York to Minnesota and Newfoundland.

SPECIMENS EXAMINED: Minnesota, *Arthur, Bailey & Holway;* Newfoundland, *Waghorne;* New York, *Peck.*

Distinguished by the fusiform, many-septate spores.

On gross characters the species cannot be distinguished from *Scoleconectria scolecospora* (Bref.) Seaver, however the habitat of the two species is different and this so far as our observations have gone is constant. The spore characters of the two species are very different.

From the presence of the minute spore-like bodies which often obscure the true ascospores this species is also likely to be confused with *Nectria Coryli* Fuckel.

Chilonectria Rosellinii (Carest.) Sacc. may also be identical with this species but in the absence of specimens it is impossible to determine.

6. **Scoleconectria Atkinsonii** (Rehm)

Calonectria Atkinsonii Rehm, Ann. Myc. **2**: 178. 1904.

Perithecia erumpent in dense clusters 1–2 mm. in diameter; individual perithecia subconical, tapering into a prominent obtuse ostiolum, at first densely yellow-furfuraceous with the ostiolum bare and darker-colored, finally becoming bare and dark brownish-black; asci clavate with a subtruncate apex and slender stem-like base, 90–100 × 15–17 mic., 8-spored; spores fusoid or subfusiform, at first 1-septate becoming 3-septate and constricted at the middle septum, mostly curved, hyaline or subhyaline, 27–33 × 8–9 mic.; paraphyses filiform, 3 mic. in diameter.

On dead branches of *Acer, Crataegus, Tilia,* etc.

TYPE LOCALITY: New York.

DISTRIBUTION: New York to Ontario, Canada.

EXSICCATI: Ellis & Everh. Fungi Columbiani, *2006* (as *Calonectria chlorinella* (Cooke) Ellis & Everh.). Other specimens examined: New York, *Atkinson 5240* (cotype), *Cooke;* Ontario, Canada, *Dearness.*

The species was described by Ellis & Everh. N. Am. Pyrenom. *113* as *Calonectria chlorinella* (Cooke) Ellis & Everh., with which species it has often been confused.

20. ECHINODOTHIS Atk.; Bull. Torrey Club **21**: 224. 1894

Stroma subfleshy or corky, light colored, pulvinate to subglobose or irregular in form, often constricted at the base, sometimes entirely surrounding the host, consisting or several layers of different consistency; perithecia superficial, scattered, subcylindrical, sessile, giving an echinulate appearance to the stroma; asci cylindrical, 8-spored; spores linear, septate, at length separating at the septa into short segments.

Type species: *Hypocrea tuberiformis* Berk. & Rav.

1. ECHINODOTHIS TUBERIFORMIS (Berk. & Rav.) Atk. Bull. Torrey Club **21**: 224. 1894

Hypocrea tuberiformis Berk. & Rav. Grev. **4**: 13. 1875.

Dussiella tuberiformis Patouillard, Soc. Myc. France **6**: 107 (in part). 1890.

Hypocrella tuberiformis Atkinson, Bot. Gaz. **16**: 282. 1891.

Stroma subglobose, 1 cm. or more in diameter, entire, lobed or divided, seated upon the reed or upon the leaf sheath and fastened by a whitish mycelium consisting of radiating threads which are sometimes tinged yellowish brown; substance leathery or corky, consisting of three layers, an inner layer white to pinkish, an intermediate layer light ochre and an outer layer cinnamon; stroma externally dark brownish becoming black; conidiophores needle-shaped; conidia oval to fusoid, 3–4 × 7–10 mic.; perithecia entirely superficial in small clusters or evenly distributed over the exposed surface of the stroma; subconical in form, giving the whole stroma a spiny appearance; clothed except the apex with a dense covering of minute threads which are at first whitish becoming cinnamon-colored, the naked apex becoming black, about .3 × 1 mm.; asci 8-spored cylindrical, with a swelling at the apex, very large, 475–750 × 14–20 mic.; spores nearly as long as the ascus, hyaline or slightly yellowish, many-septate, joints 15 × 4–5 mic. (*pl. 13, f. 15*).

On stems of *Arundinaria*.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina to Alabama.

ILLUSTRATIONS: Atkinson, Bot. Gaz. **16**: *pl. 25*.

EXSICCATI: Ravenel, Fungi Am. Exsicc. *733*. Other specimens examined: Alabama, *Atkinson 2218;* South Carolina, *Ravenel 619*.

The first description of this species was evidently drawn from

sterile specimens which probably accounts for its having been placed in the genus *Hypocrea*. A note from Kew made from examination of Berkeley and Ravenel's specimen No. 1220 states "no spores visible." Small cavities beneath the surface of the stroma were evidently mistaken for the perithecia. This is the number from which the description was drawn in Grevillea 4: 13.

Other specimens examined from the Ravenel collection show mature perithecia. The spore characters suggest *Hypocrella* or *Epichloe* but the superficial position of the perithecia bar it from either of those genera in both of which the perithecia are entirely immersed or with the necks slightly protruding.

21. THYRONECTRIA Sacc. Grevillea 4: 21. 1875

Pleonectria Sacc. Nuov. Giorn. Bot. It. 8: 178. 1876.

Stroma erumpent-superficial or subimmersed with the perithecia in dense cespitose clusters; individual perithecia subglobose, smooth or rough or often clothed with a yellowish-green, furfuraceous coat which sometimes disappears with age leaving the perithecia dark colored, red to brownish, collapsing or entire; asci 8-spored, cylindrical to clavate; spores hyaline, when mature many-septate and muriform, often accompanied by minute spore-like bodies which are much smaller in size.

Type species: *Thyronectria Patavina* Sacc.

Distinguished by the muriform, hyaline spores.

Spores elliptical, 2 times as long as broad.
- Perithecia subimmersed, greenish. — 1. *T. pyrrhochlora.*
- Perithecia erumpent-superficial, not green.
  - Perithecia dark brownish; spores small, 10–15 × 7–9 mic. — 2. *T. denigrata.*
  - Perithecia reddish; spores large, 16–30 mic. long.
    - Spores 20–30 × 10–12 mic., on bark of *Carya*. — 3. *T. missouriensis.*
    - Spores 16–20 × 7–8 mic., on *Ribes*. — 4. *T. berolinensis.*

Spores subelliptical, accompanied by minute spore-like bodies. — 5. *T. sphaerospora.*

1. THYRONECTRIA PYRRHOCHLORA (Auers.) Sacc. Michelia 1: 325. 1878

Nectria pyrrhochlora Auers. Hedwigia 8: 88. 1869.

Valsa Xanthoxyli Peck, Ann. Rep. N. Y. St. Mus. 31: 49. 1879.

Pseudovalia xanthoxyli Sacc. Syll. Fung. **2**: 137. 1883.

Fenestella Xanthoxyli Sacc. Syll. Fung. **2**: 332. 1883.

Pleonectria pyrrhochlora Winter; Rabenh. Krypt. Fl. 1^2: 108. 1887.

Thyronectria virens Hark.; Ellis & Everh. N. Am. Pyrenom. 92. 1892.

Thyronectria Xanthoxyli Ellis & Everh. N. Am. Pyrenom. 92. 1892.

Perithecia cespitose in rounded or elongated clusters, seated on the inner bark, finally bursting through the epidermis, becoming more or less superficial, often so densely cespitose that the perithecia appear to be united, at first covered with a thin olive-green tomentum, or powdery material, with the ostiolum protruding and bare, the entire perithecium becoming more or less bare with age, about 300 mic. in diameter; asci clavate, 100–125 mic. long, 8-spored; spores crowded, elliptical, straight or curved, hyaline or slightly yellowish, many-septate and muriform, 18–24 × 7–8 mic.

On branches of *Acer, Fraxinus* and *Xanthoxylum.*

TYPE LOCALITY: Europe.

DISTRIBUTION: New York to Ontario and Ohio.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2546, 3310.* Other specimens examined: Ohio, *Morgan;* Ontario, *Dearness 1484.*

2. **Thyronectria denigrata** (Winter)

Pleonectria denigrata Winter, Bull. Torrey Club **10**: 49. 1883.

Perithecia erumpent in very dense, large, rounded clusters 2–5 mm. in diameter, seated on a brownish stroma; individual perithecia nearly globose, minutely roughened, dark brownish with a prominent, black, shining ostiolum finally becoming black, 350–450 mic. in diameter; asci cylindrical, 50–70 × 8–10 mic., 8-spored; spores 1-seriate or crowded, short elliptical, hyaline or slightly yellowish, 3–5-septate, becoming muriform, often a little constricted, 10–15 × 7–9 mic.

On branches of *Gleditschia triacanthos.*

TYPE LOCALITY: Lexington, Kentucky.

DISTRIBUTION: Delaware to Kansas and Kentucky.

EXSICCATI: Ellis, N. Am. Fungi, *1334;* Ellis & Everh. N. Am. Fungi, *2372.* Other specimens examined: Delaware, *Commons;* Kansas, *Bartholomew;* Kentucky, *Kellerman;* Missouri, *Webber;* Ohio, *Morgan.*

3. **Thyronectria missouriensis** (Ellis & Everh.)

Nectria missouriensis Ellis & Everh. Jour. Myc. **4**: 57. 1888.

Pleonectria missouriensis Sacc. Syll. Fung. **9**: 990. 1891.

Paronectria missouriensis Rabenhorst-Winter, Fungi Europaei, *3748*. 1891.

Perithecia cespitose on the stroma in clusters of 6–20, dull red, nearly globose, smooth or minutely rough, with a prominent ostiolum, usually not collapsing, 250–300 mic. in diameter; asci clavate, 100–120 × 12–15 mic., 8-spored; spores crowded irregularly in the ascus, large, elliptical, straight or a little curved, hyaline or very slightly yellowish, 6–7-septate, with several longitudinal septa, dividing the spore into numerous small cells, 20–30 × 10–12 mic.

On bark of *Carya*.

TYPE LOCALITY: Concordia, Missouri.

DISTRIBUTION: Delaware to Missouri.

SPECIMENS EXAMINED: Missouri, *Demetrio 276*.

Distinguished from *T. berolinensis* (Sacc.) Seaver by the larger size of the spores as well as by the difference in host and a slight variation in perithecial characters.

4. **Thyronectria berolinensis** (Sacc.)

Nectria Ribis Niessl, Verh. Nat. Ver. Brumm **2**: 114 (homonym). 1865.

Pleonectria berolinensis Sacc. Michelia **1**: 123. 1878.

Pleonectria Ribis Karst. Medd. Soc. Fauna Fl. Fenn. **5**: 42. 1879.

Perithecia erumpent in large cespitose clusters 1–3 mm. in diameter on a stroma which becomes indistinct in aged specimens; individual perithecia dull brick-red becoming darker with age and often quite black, smooth or nearly so, entirely collapsing becoming pezizoid with age, 250–300 mic. in diameter; asci cylindrical-clavate, 8-spored; spores 1-seriate, elliptical, 5–9-septate and muriform, hyaline or very slightly yellowish, 16–20 × 7–8 mic.

On dead branches of *Ribes* (wild and cultivated).

TYPE LOCALITY: Germany.

DISTRIBUTION: Massachusetts to Montana.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 7–8*.

EXSICCATI: *Ellis,* N. Am. Fungi, *470;* Ellis & Everh. Fungi

Columbiani, *26, 470.* Other specimens examined: Montana, *Anderson 396;* Iowa, *Holway;* Massachusetts, *Farlow;* N. Dakota, *Seaver* (various collections).

5. **Thyronectria sphaerospora** (Ellis & Everh.)

Nectria sphaerospora Ellis & Everh.; Bessey & Webber, Ann. Rep. Neb. St. Board Agric. **1889**: 193. 1890.

Chilonectria crinigera Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 246. 1891.

Perithecia cespitose on a tubercular stroma in small clusters of 3–12 each; individual perithecia subglobose, papillate, minutely rough, at first covered with a brownish furfuraceous coat, finally bare and nearly black, slightly collapsing or entire, about 300–400 mic. in diameter; asci clavate, about 50–70 × 12–15 mic. at first filled with numerous minute spore-like bodies 2–3 × 1 mic., among which are the true spores, 8 in each ascus; ascospores subglobose, mostly 1-seriate, becoming about 3-septate and muriform, 5–8 mic. in diameter, surrounded by numerous spore-like bodies which appear like minute appendages.

On bark of *Fraxinus* and *Gleditschia.*

TYPE LOCALITY: Lincoln, Nebraska.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Nebraska, *Webber* (type).

22. **Thyronectroidea** gen. nov.

Perithecia cespitose in erumpent clusters as in *Thyronectria;* asci clavate-cylindrical, 8-spored; spores elliptical, many-septate, becoming muriform, at first hyaline, becoming dark brown.

Type species: *Thyronectria chrysogramma* Ellis & Everh.

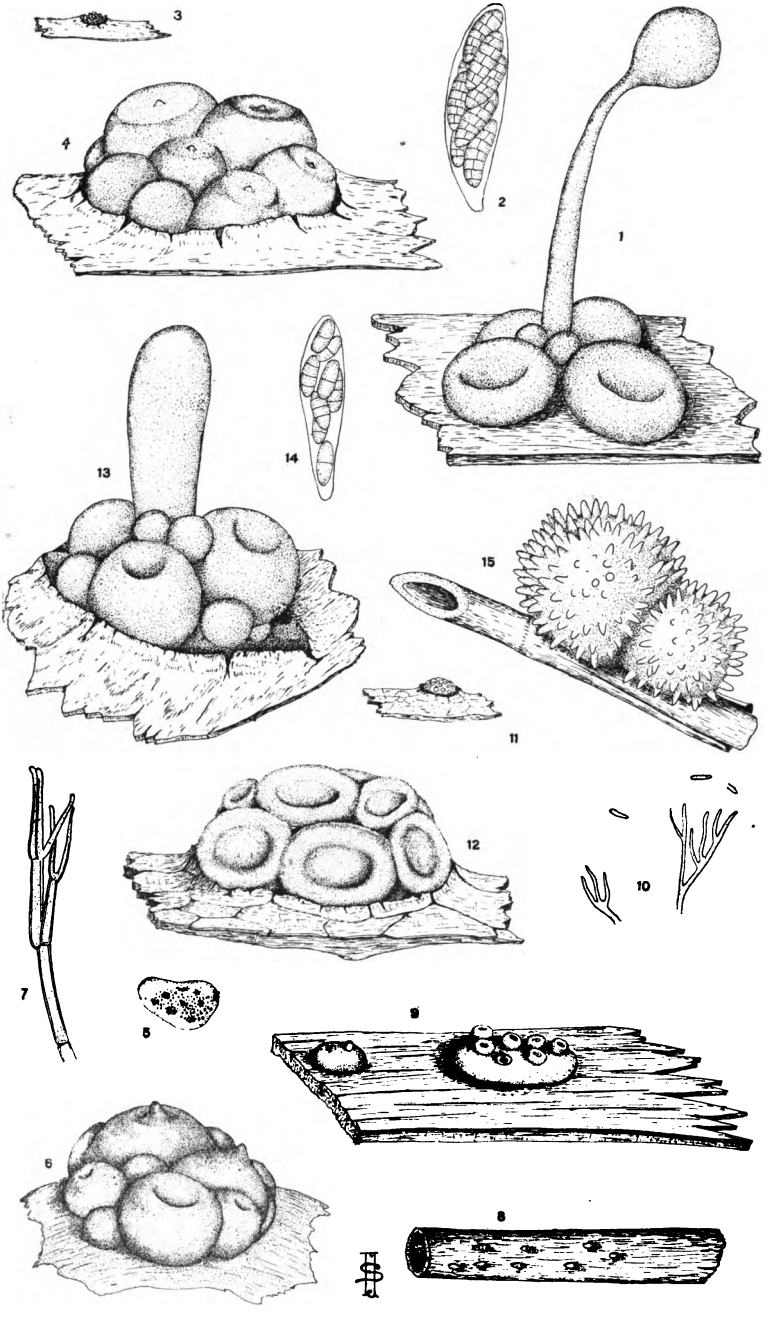
Distinguished from *Thyronectria* by the colored spores.

1. **Thyronectroidea chrysogramma** (Ellis & Everh.)

Thyronectria chrysogramma Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 245. 1891.

Mattirolia chrysogramma Sacc. Syll. Fung. 9: 993. 1891.

Perithecia springing from below the epidermis in dense cespitose clusters of 3–6 perithecia each; individual perithecia ovate, .25–.5 mm. in diameter, clothed with a greenish-yellow coat with the ostiolum bare and black; asci clavate-cylindrical, 150–175 × 14–18 mic., 8-spored; spores 2-seriate, elliptical, mostly a little



CREONECTRIEAE

curved, 7–10-septate, with very faint, interrupted, longitudinal septa, at first hyaline, becoming quite dark brown, 25–35 × 10–12 mic.; paraphyses abundant.

On bark of *Ulmus americana*.

TYPE LOCALITY: Manhattan, Kansas.

DISTRIBUTION: Kansas to Ontario and New York.

SPECIMENS EXAMINED: Ohio, *Morgan;* Ontario, Canada, *Dearness*.

NEW YORK BOTANICAL GARDEN.

EXPLANATION OF PLATE XIII.

1. *Megalonectria pseudotrichia* (Schw.) Speg., × 25.
2. *Megalonectria pseudotrichia* (Schw.) Speg., asci and spores, × 400.
3. *Creonectria pithoides* (Ellis & Everh.) Seaver, natural size.
4. *Creonectria pithoides* (Ellis & Everh.) Seaver, × 25.
5. *Creonectria seminicola* Seaver, two thirds natural size.
6. *Creonectria seminicola* Seaver, × 25.
7. *Creonectria seminicola* Seaver, conidiophores, × 400.
8. *Creonectria tuberculariformis* (Rehm) Seaver, natural size.
9. *Creonectria tuberculariformis* (Rehm) Seaver, × 10.
10. *Creonectria tuberculariformis* (Rehm) Seaver, conidiophores, × 400.
11. *Creonectria rubicarpa* (Cooke) Seaver, natural size.
12. *Creonectria rubicarpa* (Cooke) Seaver, × 25.
13. *Scoleconectria canadensis* (Ellis & Everh.) Seaver, × 25.
14. *Scoleconectria canadensis* (Ellis & Everh.) Seaver, asci and spores, × 400.
15. *Echinodothis tuberiformis* (Berk. & Rav.) Atk., × 2.

THE HYPOCREALES OF NORTH AMERICA III.

FRED J. SEAVER

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THE HYPOCREALES OF NORTH AMERICA—III.

FRED J. SEAVER

(WITH PLATES 20 AND 21, CONTAINING 37 FIGURES)

Family II. HYPOCREACEAE

Stromata conspicuous, seated directly on the substratum or springing from a sclerotium in the bodies of insects, fungi, or the ovaries and stems of plants, effused without definite margin, patellate, substipitate or erect; perithecia partially to entirely immersed in the stroma, rarely subsuperficial (especially in aged specimens); asci cylindrical or clavate, 8–16-spored; spores subglobose to filiform, simple or compound, hyaline or colored.

Stroma seated directly on the substratum, usually patellate or effused, rarely clavate and erect; spores rarely filiform.	HYPOCREAE.
Stroma springing from a sclerotium, usually erect and clavate, rarely depressed; spores filiform.	CORDYCEPTEAE.

Tribe III. HYPOCREAE

Stromata patellate or effused, rarely clavate and erect, not springing from a sclerotium; perithecia partially to entirely immersed, papillate, with the neck often protruding; asci cylindrical or clavate, 8–16-spored; spores subglobose, elliptical, fusiform or filiform, simple or compound, hyaline or simple.

Asci 16-spored (by the separation of each original spore into two subglobose cells).	
Stroma patellate or effused.	
Spores hyaline.	23. HYPOCREA.
Spores becoming greenish or brownish.	24. CHROMOCREA.
Stroma clavate and vertical.	25. PODOSTROMA.
Asci 8-spored; spores elliptical, fusiform or filiform.	
Stroma with stilbum-like outgrowths.	26. STILBOCREA.
Stroma without stilbum-like outgrowths.	
Spores elliptical to fusiform.	
Spores simple or doubtfully septate.	
Spores colored.	27. CHROMOCREOPSIS.
Spores hyaline.	

Stroma very scant; perithecia subsuperficial.	28. BYSSONECTRIA.
Stroma profuse; perithecia immersed.	29. PECKIELLA.
Spores 1-septate, fusiform or subfusiform.	
Stroma cottony or subfleshy; spores fusiform.	30. HYPOMYCES.
Stroma fleshy; spores elliptical.	31. HYPOCREOPSIS.
Spores filiform.	
Perithecia enclosed in a membranaceous wall.	32. OOMYCES.
Perithecia not enclosed in a membranaceous wall.	
Stroma very scant, cottony, white.	33. BARYA.
Stroma subfleshy, of variable color.	
Stroma sheathing, on stems of grasses.	34. TYPHODIUM.
Stroma patellate or subpatellate.	35. HYPOCRELLA.

DOUBTFUL GENERA

Glaziella. Fruit unknown.

23. HYPOCREA Fries, Syst. Orbis Veg. 104. 1825

Stroma subglobose to patellate, fleshy or subfleshy, usually with an abrupt margin which in older specimens is more or less free, or irregular in outline and effused without definite margin; perithecia entirely immersed, subglobose or ovate with the necks slightly protruding; asci cylindrical originally with 8 spores, each of which separates into 2 subglobose or slightly cuboid cells, at maturity 16-spored; spores subglobose or cuboid, hyaline.

Type species: *Sphaeria rufa* Pers.

Distinguished by the 16-spored asci and hyaline spores. There is so little variation in the spores of the species of this genus that we must depend almost entirely upon gross characters for diagnoses of species.

Stromata patellate, with definite outline, for the most part on wood and bark.	
Stromata dark colored, dark red, brown or purplish-black.	
Stromata red or brown.	
Stromata reddish-brown or dark brown.	1. *H. rufa.*
Stromata wine-colored or dark red.	2. *H. scutellaeformis.*
Stromata purplish-black or olive.	
Stromata purplish, large, .5–1 cm. in diameter.	3. *H. lenta.*

Stromata olivaceous, small, 1–2 mm. in diameter.	4. *H. minima.*
Stromata bright colored, whitish or bright yellow.	
Stromata whitish.	5. *H. chionea.*
Stromata bright yellow.	6. *H. patella.*
Stromata effused, spreading irregularly, with no definite outline.	
Occurring on wood and bark.	
Stromata very dark olivaceous.	7. *H. olivacea.*
Stromata bright lemon-yellow.	8. *H. sulphurea.*
Occurring on fungi.	
Stroma bright colored.	
Stroma orange, on *Tyromyces.*	9. *H. aurantiaca.*
Stroma lemon-yellow, often fading.	10. *H. citrina.*
Stroma dull pallid or whitish.	
On *Tyromyces* and related plants.	11. *H. pallida.*
Forming rings on cups of *Cyathus.*	12. *H. latizonata.*

1. HYPOCREA RUFA (Pers.) Fries, Summa Veg. Scand. 383. 1849

Sphaeria rufa Pers. Obs. Myc. 1: 20. 1796.

Stromata gregarious, subhemispherical to patellate, occasionally confluent and more or less irregular but normally quite regular in form, 2 mm. to 1 cm. in diameter (mostly 2–5 mm.), externally brick-red, the margin in young specimens white, later becoming brown and in old specimens often free, becoming darker with age, surface of the stroma roughened by the necks of the perithecia which protrude slightly; perithecia nearly globose, 175–200 mic. in diameter; asci cylindrical, becoming 16-spored, 75–100 × 5 mic. (spore-bearing part 60–75 mic.); spores nearly globose, hyaline with a central oil-drop (*pl. 20, f. 6–8*).

On wood and bark of various kinds and occasionally on old fungi.

TYPE LOCALITY: Europe.

DISTRIBUTION: Maine to N. Dakota and S. Carolina. Probably occurs throughout N. America.

ILLUSTRATIONS: Winter; Rabenh. Krypt. Fl. *pl. 89, f. 1–3;* Lindau, E. & P. Nat. Pfl. *f. 243,* A–D.

EXSICCATI: Ellis, N. Am. Fungi, *157;* Ellis & Everh. N. Am. Fungi, *1552;* Ravenel, Fungi Car. Exsicc. *53.* Other specimens examined: Maine, *Miss. White;* N. Jersey, *Ellis 608;* New York, *Zabriskie;* N. Dakota, *Seaver;* Ohio, *Morgan 936, 940.*

2. HYPOCREA SCUTELLAEFORMIS Berk. & Rav. (nomen nudum); Ellis & Everh. N. Am. Pyrenom. 80. 1892.

Stromata gregarious, patellate or subhemispherical, .5–1 mm. in diameter, with the margin free and slightly undulated, roughened slightly by the protruding necks of the perithecia, externally beautifully wine-colored, becoming darker with age, occasionally blackish, internally white.

On the bark of *Acer rubrum*.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ravenel, Fungi Car. Exsicc. *31*.

The species appears distinct in its color and gross characters. Although the stromata externally seem to indicate the presence of perithecia no asci or spores could be seen.

3. HYPOCREA LENTA (Tode) Berk. & Br. Jour. Linn. Soc. **14**: 112. 1875

Sphaeria lenta Tode, Fungi Meckl. **2**: 30. 1791.

Sphaeria Schweinitzii Fr. Elench. Fung. **2**: 60. 1828.

Sphaeria contorta Schw. Trans. Am. Phil. Soc. II. **4**: 194. 1832.

Sphaeria rigens Fr. Elench. Fung. **2**: 61. 1828.

Hypocrea Schweinitzii Sacc. Syll. Fung. **2**: 522. 1883.

Hypocrea contorta Berk. & Curtis; Berk. Grevillea **4**: 14. 1875.

Hypocrea rigens Sacc. Michelia **1**: 301. 1878.

Stromata gregarious, 2 mm.–1 cm. in diameter, lens-shaped, margin free, often becoming undulated, dark colored externally becoming almost black with a shade of olive-green, white within, fleshy becoming hard when dry; surface roughened by the necks of the slightly protruding perithecia; perithecia subglobose, 150–175 mic. in diameter; asci cylindrical, becoming 16-spored, 60–75 × 4–5 mic.; spores subglobose with 1 large oil-drop, about 4 mic. in diameter.

On wood and bark of various kinds.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: New Jersey to Ontario, California, and Louisiana.

ILLUSTRATIONS: Tode, Fungi Meckl. *pl. 12, f. 102*.

EXSICCATI: Ravenel, Fungi Am. Exsicc. *642;* Ellis, N. Am. Fungi *156*. Other specimens examined: Kansas, *Swingle, Cra-*

gin; Louisiana, *Langlois;* N. Jersey, *Ellis;* Ontario, Canada, *Harkness;* S. Carolina, *Ravenel.*

4. HYPOCREA MINIMA Sacc. & Ellis, Michelia **2**: 570. 1882

Stromata scattered, superficial, patellate or subpatellate, disc orbicular, very dark, almost black, scarcely 1 mm. in diameter; surface roughened by the slightly protruding necks of the perithecia; asci cylindrical, becoming 16-spored, 60–75 × 4 mic.; spores subglobose, hyaline, with 1 large oil-drop, about 4 mic. in diameter.

On bark of *Magnolia.*

TYPE LOCALITY: Newfield, N. Jersey.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: N. Jersey, *Ellis* (cotype).

In color the species resembles *H. lenta* but is distinguished by its very small size.

5. HYPOCREA CHIONEA Ellis & Everh. N. Am. Pyrenom. 79. 1892

Stromata gregarious, subhemispherical becoming patellate or subpatellate, fleshy, 1–2 mm. in diameter, white or very light yellowish, surface roughened by the slightly protruding necks of the perithecia; necks of the perithecia darker in color than the surrounding surface of the stroma, giving it a punctate appearance; asci cylindrical, 50–60 × 4 mic., becoming 16-spored; spores subglobose, with 1 central oil-drop, about 4 mic. in diameter.

On decaying wood on the under side of a log to which may be due its white color.

TYPE LOCALITY: Ontario, Canada.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Canada, *Dearness* (type).

6. HYPOCREA PATELLA Cooke & Peck, Ann. Rep. N. Y. State Mus. **29**: 57. 1878

Stromata gregarious, patellate and regular is form, consisting of a whitish mycelium with a yellow center, becoming entirely bright yellow, inclined to ochraceous, 1–2 mm. in diameter, margin free, surface punctate with the necks of the perithecia which protrude slightly, somewhat wrinkled when dry; asci cylindrical, 60–75 × 4–5 mic., at first 8-spored, becoming 16-spored by the separation of each original spore into 2 subglobose cells; spores subglobose, hyaline.

On dead wood especially on or surrounding other old sphaeriaceous fungi.

TYPE LOCALITY: Buffalo, N. York.

DISTRIBUTION: New York to Louisiana.

SPECIMENS EXAMINED: New York, *Seaver* (various collections); Louisiana, *Langlois 2181;* West Virginia, *Nuttall 75.*

The description of this species is drawn from material identified by Mr. Peck. The species has been frequently collected by the writer about New York City.

7. HYPOCREA OLIVACEA Cooke & Ellis, Grevillea **6**: 92. 1878

Hypocrea melaleuca Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 245. 1891.

Stromata scattered, effused and irregular in form, consisting at first of a patch of thin, white tomentum .5–1 cm. in diameter, becoming fleshy and of an olive shade, gradually becoming darker, at length nearly black and punctate from the slightly protruding necks of the perithecia; asci cylindrical, 65–75 × 3–4 mic. becoming 16-spored; spores hyaline, subglobose, 3 mic. in diameter.

On pine boards, bark of *Sassafras,* and oak chips.

TYPE LOCALITY: N. Jersey.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Grevillea **6**: *pl. 10, f. 25.*

SPECIMENS EXAMINED: N. Jersey, Ellis *2826* (cotype).

The species forms irregular dark colored patches which on drying break up into a number of smaller parts of variable size and number.

Mr. Ellis seems to have been uncertain as to whether *H. melaleuca* was distinct from *H. olivacea,* the stroma of the former having been described as whitish. When examined during the present season the type of *H. melaleuca* shows the stroma to be decidedly greenish and conforms exactly to *H. olivacea.*

8. HYPOCREA SULPHUREA (Schw.) Sacc. Syll. Fung. **2**: 535. 1883

Sphaeria sulphurea Schw. Trans. Am. Phil. Soc. II. **4**: 193. 1832.

Stroma broadly effused, forming irregular patches often several cm. in diameter, at first consisting of small tufts of white mycelium, the central part soon assuming a lemon-yellow color, at

maturity consisting of a bright lemon-yellow stroma with a pale, whitish margin, color in dried specimens fairly constant, rarely slightly faded; perithecia entirely immersed and appearing as minute glands, slightly darker than the stroma; asci cylindrical, becoming 16-spored by the separation of each original spore into 2 subglobose cells, 80–110 mic. in length; spores about 4 × 5 mic., subglobose or commonly subcubical from mutual pressure, granular within.

On bark of various kinds of trees and shrubs, *Acer, Alnus, Salix, Tilia,* etc., often on *Exidia glandulosa.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Connecticut to N. Dakota, Alabama and S. Carolina.

EXSICCATI: Ravenel, Fungi Am. Exsicc. *641,* Fungi Car. Exsicc. *52;* Wilson & Seaver, Ascom. & Lower Fungi, *57.* Other specimens examined: Alabama, *Earle, Underwood;* Canada, *Macoun;* Connecticut, *Thaxter;* Delaware (no name); Florida, *Calkins;* Iowa, *Holway;* Louisiana, *Seymour;* N. Dakota, *Seaver;* N. Jersey, *Ellis;* N. York, *Seaver;* Ohio, *Morgan, Lloyd;* Pennsylvania, *Haines, Everhart & Jefferis,* and *Schweinitz* (type).

This species has been commonly known in this country under the name of *Hypocrea citrina* (Pers.) Fries, to which species it is quite similar. Its habitat on bark often where there is no trace of other fungi, its bright color and very large asci and spores seem to be sufficient characters by which it can be distinguished.

In N. Dakota this species has been collected commonly by the writer on dead branches of basswood but was not found in that locality on dead branches of other trees. In other localities it has been commonly reported on other trees and shrubs. Thaxter reports it as occurring in Connecticut only on branches of alders. The species has also been reported by Montagne in Cuba on the bark of trees.

9. HYPOCREA AURANTIACA Peck, Ann. Rep. N. Y. State Mus. **51**[1]: 295. 1898

Stroma effused, overspreading and entirely covering the hymenium of the host, cottony but giving rise to a continuous stroma

equal in extent to that of the hymenium of the host, deep orange, paler near the margin, staining the host of a similar color; perithecia orange, thickly scattered or often crowded near the center of the stroma where the color is much darker, partially immersed in the substratum; asci cylindrical, becoming 16-spored by the separation of each original spore into 2 subglobose cells; spores subglobose or subcubical, 3–4 mic. in diameter.

On *Tyromyces chioneus.*

TYPE LOCALITY: New York.

DISTRIBUTION: New York.

SPECIMENS EXAMINED: New York, *Peck* (type).

Distinguished from *H. pallida* Ellis & Everh. only by its orange color.

10. HYPOCREA CITRINA (Pers.) Fries, Summa Veg. Scand. 383. 1849

Sphaeria citrina Pers. Obs. Myc. 1: 68. 1796.

? *Hypocrea Karsteniana* Niessl.; Rehm, Hedwigia 22: 53. 1883.

? *Hypocrea fungicola* Karsten; Winter, Rabenh. Krypt. Fl. 1²: 141. 1887.

Stroma effused, spreading irregularly often for several cm. occasionally interrupted, subfleshy, at first whitish, at length lemon-yellow with the margin cottony and lighter colored, within whitish, whole stroma becoming more or less faded with age often subpallid; perithecia immersed, numerous, ovoid, yellowish; asci cylindrical, 62–75 mic. long, becoming 16-spored by the separation of each original sport into 2 subglobose cells with the lower slightly longer; individual spores 3–4 mic. in diameter.

On soil, old fungi, etc.

TYPE LOCALITY: Europe.

DISTRIBUTION: Connecticut to N. York.

EXSICCATI: Shear, N. York Fungi, *363*. Other specimens examined: Connecticut, *Thaxter,* Wisconsin.

This species seems to be less common in America than in Europe, although through its confusion with the species *H. sulphurea* (Schw.) Sacc. it has been commonly reported. The species was originally described as terrestrial and an attempt has been made to separate the terrestrial form from that occurring on old fungi. It is doubtful if the two are distinct.

11. HYPOCREA PALLIDA Ellis & Everh. Jour. Myc. 2: 65. 1886

Stroma effused, overspreading and entirely covering the hymenium of the host, cottony but giving rise to an even stratum equal in diameter to that of the host, at first pallid or pale yellow or often with a slight tinge of rust-red, paler near the margin; perithecia thickly scattered and partially immersed in the substratum with the ostiola projecting, amber, darker than the substratum; asci cylindrical, 50–75 × 4–5 mic. becoming 16-spored by the separation of each original spore into 2 subglobose cells; spores 3–4 mic. in diameter, subglobose or slightly cubical.

On the hymenium of species of *Tyromyces*.

TYPE LOCALITY: N. Jersey.

DISTRIBUTION: N. Jersey to Canada.

SPECIMENS EXAMINED: Connecticut (no name); N. Jersey, *Ellis* (various collections); Prince Edward's Island, Canada, *Macoun*.

Hypocrea aurantiaca Peck agrees with this species in habitat and general morphological characters but seems to differ in possessing a decidedly orange color. The various specimens examined would seem to indicate that the difference in color is due to a difference in age as some of the present species examined show a trace of rust-red approaching that of *H. aurantiaca*, and one specimen in the Ellis collection is labeled in the handwriting of Mr. Ellis, *H. pallida* var. *aurea*. Field observation is necessary in order to determine whether the two species are identical but for the present they are allowed to stand.

12. HYPOCREA LATIZONATA Peck; Ellis & Everh. N. Am. Pyrenom. 79. 1892

Stroma consisting of a white subiculum which forms a band 5 mm. in diameter, entirely surrounding the outside of the cups of the host; perithecia thickly gregarious, immersed, with the ostiola protruding, darker colored, brownish-black; asci cylindrical, 60–75 mic. long, becoming 16-spored by the separation of each original spore into 2 subglobose cells; individual spores 3–4 mic. in diameter, the lower of each pair slightly longer (*pl. 20, f. 9–10*).

On the outside of the cups of *Cyathus striatus*.

TYPE LOCALITY: Ohio.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: Ohio, *Morgan* (type).

Distinguished by its habitat and the peculiar ring-like formations of the stroma.

DOUBTFUL SPECIES

Hypocrea cervina Berk. & Curtis, Jour. Linn. Soc. **10**: 376. 1869.

"Stromate irregulari plano, margine obtuso libero cervino subtomentoso, intus subconcolori; peritheciis superficialibus, ostiolis quandoque elongatis cylindricis; sporidiis subglobosis octonis."

On dead wood. Sporidia .00014 inch in diameter. Stroma 2 lines across.

Hypocrea laetior Berk. & Curtis; Berk. Jour. Linn. Soc. **10**: 376. 1869.

"Stromate orbiculari sublobato adnato laete cervino; peritheciis immersis, ostiolis prominulis nigris; sporidiis subglobosis 16."

"On dead wood. Sporidia .0002 inch in diameter, sixteen in each ascus. Stroma 1–1.5 line across. Closely allied to the last" (*H. cervina* Berk. & Curtis).

Hypocrea maculaeformis Berk. & Curtis; Berk. Jour. Linn. Soc. **10**: 376. 1869.

"Tenuis, umbrina, irregularis, ostiolis brunneolis notata; peritheciis elongatis immersis."

"On a hard lemon-coloured, fleshy *Polyporus,* which is probably much altered by the parasite. Forming thin map-like spots. Sporidia .0004 inch long."

Hypocrea ochroleuca Berk. & Rav.; Berk. Grevillea **4**: 14. 1875.

"Effused, thin, ochro-leucous, seated on a pale mycelium, with a barren border, often cracked when old."

Hypocrea polyporoidea Berk. & Curtis, Grevillea **4**: 15. 1875.

"Fawn-coloured; perithecia free, tomentose, with a naked ostiolum seated on a pale crust, here and there elevated, which is thin towards the margin. A very curious species."

On beech, Alabama.

Hypocrea armeniaca Berk. & Curtis, *Hypocrea insignis* Berk. & Curtis, *Hypocrea saccharina* Berk. & Curtis and *Hypocrea parasitans* were described from imperfect material.

EXCLUDED SPECIES

Hypocrea subviridis Berk. & Curtis.

Hypocrea Richardsoni Berk. & Mont.

24. **Chromocrea** gen. nov.

Stromata patellate or subpatellate, whitish, yellowish or reddish to greenish-black, more or less variable in a given species, fleshy; perithecia entirely immersed with necks only slightly prominent; asci cylindrical, becoming 16-spored by the separation of each original spore into 2 subglobose cells; spores colored, greenish or brownish.

Type species: *Sphaeria gelatinosa* Tode.

Distinguished from *Hypocrea* by the colored spores.

Stromata yellowish to greenish-black.	
Stromata sessile, yellowish to green, then greenish-black	1. *C. gelatinosa.*
Stromata substipitate, yellow, not becoming green.	2. *C. substipitata.*
Stromata brick-red, entirely sessile.	3. *C. ceramica.*

1. **Chromocrea gelatinosa** (Tode)

Sphaeria gelatinosa Tode, Fungi Meckl. **2**: 48. 1791.

Hypocrea gelatnosa Fries, Summa Veg. Scand. 383. 1849.

? *Hypocrea chlorospora* Berk. & Curtis, Grevillea **4**: 14. 1875.

? *Hypocrea chromosperma* Cooke & Peck, Ann. Rep. N. Y. State Mus. **29**: 57. 1878.

Hypocrea viridis Peck, Ann. Rep. N. Y. State Mus. **31**: 49. 1879.

Stromata patellate or subpatellate, fleshy, soft, becoming contracted and wrinkled when dry, at first bright lemon-yellow or yellowish-white becoming punctate with greenish dots, the necks of the perithecia filled with dark colored spores, the entire stroma becoming darker with age, finally greenish or greenish-black 1–4 mm. in diameter; perithecia entirely immersed with the necks slightly protruding and becoming rather prominent in dried specimens; asci cylindrical, becoming 16-spored by the separation of each original spore into 2 subglobose cells; spores at first green, becoming brown, 5 mic. in diameter (*pl. 20, f. 11–13*).

On decaying wood of various kinds.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: Maine to New Jersey and Iowa.

ILLUSTRATIONS: Tode, Fungi Meckl. *pl. 16, f. 123.*

SPECIMENS EXAMINED: Connecticut, *Thaxter;* Indiana, *Underwood;* Iowa, *Seaver, Holway;* Maine, *Harvey;* New Jersey, *Ellis;* Pennsylvania, *Haines.*

The British specimens referred to this name show the surface of the stroma in old specimens to be greenish-black while the base is of a translucent red. The American specimens are more often of a yellowish color with the surface becoming greenish-black. The color in the species is very variable.

2. **Chromocrea substipitata** sp. nov.

Stromata gregarious or occasionally crowded, seated on a sulphur-yellow subiculum, discoid, fleshy, with the margin elevated from the substratum, young plants substipitate; stem short, about 1 mm. thick and 1–2 mm. high, gradually expanding upwards into the subpatellate stroma; stroma plane to a little concave or convex, dull yellow, slightly punctate with the darker ostiola 1–4 mm. in diameter; asci cylindrical, becoming 16-spored by the separation of each original spore into two subglobose cells; spores becoming smoky-brown, 4 × 5 mic. in diameter.

On bark.

TYPE LOCALITY: Nicaragua.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Nicaragua, *C. L. Smith* (type).

The specimen described under this name was included in the Ellis collection under the name *Hypocrea cubispora* Ellis & Holw. from which species it differs in several points the chief of which is that the asci in the present species become 16-spored while those in *Hypocrea cubispora* Ellis & Holw. are 8-spored. There are other gross characters which are also sufficient to mark this species as distinct from the one to which it had been referred by Mr. Ellis.

The young specimens resemble very closely *Helotium citrinum* (Hedw.) Fries in form but the color is not so bright.

3. **Chromocrea ceramica** (Ellis & Everh.)

Hypocrea ceramica Ellis & Everh. N. Am. Pyrenom. 85. 1892.

Stromata appearing first as a speck of white tomentum, with a brick-red spot appearing in the center, finally becoming fleshy, rather thick and entirely brick-red without, and white within,

subpatellate, convex, becoming wrinkled when dry, punctate with the necks of the slightly protruding perithecia finally dusted over with the greenish spores; asci cylindrical, becoming 16-spored by the breaking of each original spore into 2 subglobose cells; spores about 4 mic. in diameter, the lower of each pair a little larger than the upper.

On bark of decaying limb of *Juniperus*.

TYPE LOCALITY: Connecticut.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Connecticut, *Thaxter* (type).

The stromata resemble in form and color *Hypocrea rufa* (Pers.) Fries, but the species is distinguished by its colored spores.

25. PODOSTROMA Karsten, Hedwigia **31**: 294. 1892

Podocrea (Sacc.) Lindau, E. & P. Nat. Pfl. **1**[1]: 364. 1897.

Stromata stipitate, clavate, erect, fleshy, light colored; perithecia immersed in the stroma; asci cylindrical, 16-spored; spores globose or subglobose, hyaline.

Type species: *Podostroma leucopus* Karsten.

The type of the present genus as has been observed by Professor Atkinson is similar in every way to *Podostroma alutacea* (Pers.) Atkinson except that it is reported as occurring on dead insects resembling in this the genus *Cordyceps*. Professor Atkinson is of the opinion that this report may simply indicate an extension of the range of decaying organic matter on which *Podostroma alutacea* may grow and that the two species may be identical.

Stroma clavate, yellow.	1. *P. alutaceum.*
Stroma agariciform, brown.	2. *P. brevipes.*

1. PODOSTROMA ALUTACEUM (Pers.) Atk. Bot. Gaz. **40**: 416. 1905

Sphaeria alutacea Pers. Obs. Myc. **2**: 66. 1797.
Sphaeria clavata Sow. Eng. Fungi, *pl. 159*. 1799.
Cordyceps alutacea Link, Handbk. **4**: 347. 1833.
Hypocrea alutacea Tul. Fung. Carp. **1**: 62 (in note). 1861.
? *Podostroma leucopus* Karsten, Hedwigia **31**: 294. 1892.
Podocrea alutacea Lindau, E. & P. Nat. Pfl. **1**[1]: 364. 1897.

Hypocrea Lloydii Bresadola; Lloyd, Myc. Notes **1**: 87. 1905.

Stroma vertical, consisting of a sterile stem and fertile, clavate or more or less irregular head; stem stout or slender and of variable length, entire plant averaging 2–4 cm. high above the substratum, length below the substratum variable, pale yellow, whitish or tan-colored, fertile head slightly darker; perithecia entirely immersed in the stroma or with their necks slightly protruding; asci cylindrical or slightly clavate, 50–60 × 4 mic., becoming 16-spored by the separation of each original spore into 2 segments; spores subglobose or cuboid, about 4 × 3 mic. the lower of each pair of segments a little longer (*pl. 20, f. 16*).

On wood, decaying organic materials on the ground and (dead insects?).

TYPE LOCALITY: Europe.

DISTRIBUTION: N. York to W. Virginia and N. Carolina.

ILLUSTRATIONS: Atkinson, Bot. Gaz. **40**: *pl. 14–16;* Berkeley, Outl. Brit. Fungi, *pl. 23, f. 6;* E. & P. Nat. Pfl. *f. 243,* F–H; Lloyd, Myc. Notes **1**: *f. 55;* Sow., Engl. Fungi **2**: *pl. 59;* Tul. Fung. Carp. **3**: *pl. 4, f. 1–6.*

SPECIMENS EXAMINED: New Jersey, *Ellis;* New York *Stevens.*

2. **Podostroma brevipes** (Mont.)

Cordyceps brevipes Mont. Syll. 201. 1856.

? *Hypocrea Petersii* Berk. & Curt. Grevillea **4**: 13. 1875.

Hypocrea brevipes Sacc. Michelia **1**: 304. 1878.

Stroma stipitate or substipitate, 1–2 cm. diameter, convex or often irregularly convolute, brown externally, whitish within, papillate with the necks of the slightly protruding perithecia, often dusted over with a yellowish powder, consisting of the exuded spores; stem .5–1 cm. high and 4–5 mm. thick, rugose, darker than the stroma often blackish, expanding above into the agariciform stroma; perithecia covering the upper surface of the stroma, immersed, with the necks slightly protruding, subglobose; asci cylindrical, 75 × 5 mic. becoming 16-spored by the separation of each original spore into 2 subglobose cells with the lower of each pair longer, 4–5 mic. in diameter.

On old wood.

TYPE LOCALITY: S. America.

DISTRIBUTION: Ohio to (Alabama?).

SPECIMENS EXAMINED: Ohio, *Morgan 28, 33.*

From the description *Hypocrea Petersii* Berk. & Curtis seems scarcely to differ. It is described as follows: "Agariciformis; stipite rugoso; peritheciis peripheriicis; ascis linearibus; sporidiis globosis."

26. STILBOCREA Pat. Bull. Soc. Myc. France **16**: 186. 1900

Stromata consisting of a fleshy hypocreoid base and several erect stilbum-like outgrowths, fleshy, bright colored; perithecia globose or ovate, immersed or with the necks slightly protruding; asci 8-spored; spores hyaline or subhyaline, 1-septate, smooth or rough.

Type species: *Stilbocrea Dussii* Pat.

Distinguished from *Sphaerostilbe* by the immersed perithecia.

Spores 10–12 × 7 mic.	1. *S. hypocreoides.*
Spores 10.5–12.5 × 4.5–5.5 mic.	2. *S. intermedia.*

1. **Stilbocrea hypocreoides** (Kalch. & Cooke)

Sphaerostilbe hypocreoides Kalch. & Cooke, Grevillea **9**: 26. 1880.

Stroma subpatellate or effused, 2–5 mm. in diameter with stilbum-like outgrowths; conidiophores clavate, shortly stipitate; conidia elliptical, 5 × 2 mic.; perithecia immersed in the stroma or with the necks slightly prominent; asci cylindrical, 8-spored; spores elliptical, 1-septate, hyaline, 10–12 × 7 mic., becoming slightly roughened externally.

On naked bark.

TYPE LOCALITY: S. Africa.

DISTRIBUTION: Louisiana.

ILLUSTRATIONS: Grevillea **9**: *pl. 136, f. 25.*

SPECIMENS EXAMINED: Louisiana, *Langlois.*

In the specimens examined it is difficult to find mature asci and spores so that the measurements given above are from the original description.

2. **Stilbocrea intermedia** (Ferd. & Winge)

? *Stilbocrea Dussii* Pat. Bull. Soc. Myc. France **16**: 186. 1900.

Sphaerostilbe intermedia Ferd. & Winge, Bot. Tidssk. **29**: 12. 1908.

Stroma fleshy, patellate or subpatellate, adnate to the sub-

stratum or with the margin free and with several stilbum-like outgrowths consisting of a stalk 1 mm. high and a subglobose head 400–600 mic. in diameter, when dry pale flesh-colored or yellowish-white; perithecia immersed but prominent, orange, ovoid or subglobose, 170–200 mic. in diameter; asci cylindrical, 70–85 × 5.5–7.5 mic., 8-spored; spores 1-seriate, elliptical, slightly unequal-sided, minutely roughened, 1-septate, scarcely constricted at the septum, 10.5–12.5 × 4.5–5.5 mic. (*pl. 20, f. 19–20*).

On bark of trees.

TYPE LOCALITY: Island of St. Thomas, W. Indies.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Ferd. & Winge, Bot. Tidssk. **29**: *pl. 1, f. 5.*

SPECIMENS EXAMINED: Raukiær, Island of St. Thomas (cotype).

This and the preceding species appear to be very close together.

No specimen of *Stilbocrea Dussii* Pat. has been seen but there seems to be nothing in the description of the present species to distinguish it from the former in which the spores are described as 12 × 5 mic.

27. **Chromocreopsis** gen. nov.

Stromata gregarious or scattered, tubercular and prominent or depressed, from 2 mm. to 1 cm. in diameter, bright colored or dark approaching black, fleshy or subfleshy, surface slightly roughened and dotted with the slightly protruding necks of the perithecia filled with dark colored spores; asci cylindrical to clavate, 8-spored; spores elliptical to subcuboid, simple or septation indistinct, colored brownish.

TYPE SPECIES: *Hypocrea cubispora* Ellis & Holw.

Distinguished from *Chromocrea* by the 8-spored asci.

Stromata tubercular, large, bright colored, yellow.	1. *C. cubispora.*
Stromata depressed, dark colored, brown or blackish.	
Stromata clothed below with hairs.	2. *C. hirsuta.*
Stromata naked, blackish.	3. *C. bicolor.*

1. **Chromocreopsis cubispora** (Ellis & Holw.)

Hypocrea cubispora Ellis & Holw. Jour. Myc. 1: 4. 1885.

Stromata scattered, tubercular, margin free, more or less contracted at the base often becoming substipitate, .5–1 cm. in diameter and the same in height, at first very bright lemon-

yellow and appearing pruinose, color often changing in dried specimens, surface scarcely wrinkled when dry, punctate with the slightly protruding necks of the perithecia filled with dark colored spores; asci cylindrical, 8-spored; spores subelliptical or cubical, smoky-brown, with 1–2 oil-drops, 5–7 × 4–5 mic. simple or occasionally obscurely 1-septate (*pl. 20, f. 14–15*).

On decaying wood and bark.

TYPE LOCALITY: Iowa.

DISTRIBUTION: Iowa and Jamaica.

SPECIMENS EXAMINED: Iowa, *Holway* (type); Jamaica, *Murrill 636, 736.*

2. **Chromocreopsis hirsuta** (Ellis & Everh.)

Hypocrea hirsuta Ellis & Everh.; Smith, Bull. Lab. Nat. Hist. St. Univ. Iowa **2**: 397. 1893.

Stromata gregarious or crowded, subhemispherical, coriaceous-carnose, 2–3 mm. in diameter, discoid, obsoletely margined, brown, yellowish-white inside, contracted below, centrally attached, clothed with brown, bristle-like, septate hairs 100–200 × 4 mic., convex or plane above and slightly roughened by the necks of the perithecia; perithecia buried in the stroma, ovate, about 5 mm. high; asci clavate-cylindrical, swollen at the tip, 100 × 10 mic.; spores navicular-oblong or unequally elliptical, brown, 7–8 × 3–3.5 mic.

On bark.

TYPE LOCALITY: Central America.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Nicaragua, *B. Shimek 80.*

3. **Chromocreopsis bicolor** (Ellis & Everh.)

Hypocrea bicolor Ellis & Everh. Jour. Myc. **4**: 58. 1888.

Stromata gregarious or closely crowded, subpatellate or irregular from mutual pressure, slightly convex, 1–3 mm. in diameter, cinereous, becoming dull brownish-black, white within, margin free, upper surface wrinkled when dry and punctate with the necks of the perithecia; perithecia subglobose, about .5 mm. in diameter; asci cylindrical, 70 × 5 mic., 8-spored; spores 1-seriate, elliptical, with 2 oil-drops, smoky-brown, 5 × 2–3 mic.

On decaying wood.

TYPE LOCALITY: Manhattan, Kansas.

DISTRIBUTION: Kansas and Missouri to Louisiana and Central America.

SPECIMENS EXAMINED: Kansas, *Kellerman & Swingle* (type); Louisiana, *Langlois;* Missouri (no name); Nicaragua, Central America, *Shimek.*

DOUBTFUL SPECIES

Hypocrea aurantio-cervina Ellis & Everh. Bull. Torrey Club **24**: 458. 1897.

This appears to be a *Hypoxylon.*

Hypocrea-viridi-rufa Berk. & Rav.; Berk. Grevillea **4**: 14. 1875.

A note from Kew indicates that this is probably a *Hypoxylon.*

28. BYSSONECTRIA Karst. Medd. Soc. Fauna Fl. Fenn. **6**: 6. 1881

Perithecia seated in a scant, cottony stroma, subglobose or ovoid, vertically collapsing; asci cylindrical, 8-spored; spores 1-seriate, often overlapping, elliptical, simple or occasionally pseudoseptate.

TYPE SPECIES: *Byssonectria abducens* Karst.

This genus is intermediate between *Nectria* and *Hypomyces.* The perithecia and spores are very similar to those of *Nectria* while the trace of a cottony stroma suggests *Hypomyces.*

Stroma white; perithecia violaceous.	1. *B. violacea.*
Stroma yellow; perithecia yellowish-brown.	2. *B. chrysocoma.*

1. **Byssonectria violacea** (Schmidt)

Sphaeria violacea Schmidt; Fries, Syst. Myc. **2**: 441. 1822.

Hypomyces violaceus (Schmidt) Tul. Ann. Sci. Nat. IV. **13**: 14. 1860.

Stroma consisting of a thin, white mycelial growth overspreading the substratum; perithecia thickly scattered, globose or subglobose, smooth or only minutely roughened, vertically collapsing, violaceous; asci cylindrical, 8-spored; spores 1-seriate or with the ends slightly overlapping, elliptical, simple, granular within, 6–7 × 2–3 mic.

On *Fuligo septica.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Maine.

SPECIMENS EXAMINED: Maine, *Harvey.*

The material here referred to this name corresponds well with the description of the species named above except that the spores are not septate, although they sometimes have a pseudo-septate appearance.

2. BYSSONECTRIA CHRYSOCOMA Cooke & Hark. Grevillea **12**: 101. 1884

Stroma effused, byssoid, golden-yellow; perithecia minute, gregarious, obovate, yellowish-brown, partially immersed in the stroma; asci clavate, 8-spored; spores 2-seriate, narrowly elliptical, simple or doubtfully septate, 10–13 × 3 mic.

On wood of *Eucalyptus*.

TYPE LOCALITY: California.

DISTRIBUTION: Known only from type locality.

No specimen of this species has been seen, however in notes sent from Kew the spore measurements are given and the species seems to have good characters.

DOUBTFUL SPECIES

Byssonectria rosella Cooke & Hark.; Cooke, Grevillea **12**: 101. 1884. Described from imperfect material.

Byssonectria fimeti (Cooke) Sacc. Syll Fung. **2**: 457. 1883. The species was described from material collected by Ravenel. This material has been examined by the writer and the only ascomycete found was a discomycete. Whether this was mistaken for a *Nectria* it is difficult to state.

Hypomyces exiguus Pat. Bull. Soc. Myc. France **18**: 180. 1902.

Stroma byssoid, white; perithecia globose, extruded, scattered, small, 130–160 mic. in diameter, white or slightly yellowish; asci numerous, without paraphyses, cylindrical, 30–35 × 3–4 mic., 8-spored; spores 1-seriate, hyaline, ovoid, smooth, simple, small, 3–4 × 2 mic.

On the fructification of *Stemonitis*.

According to the author of the species this is closely related to *H. violaceus* (Schmidt) Tul. No specimen has been seen.

29. PECKIELLA Sacc. Syll. Fung. **9**: 944. 1891

Peckiella Sacc. (as subgenus) Syll. Fung. **2**: 472. 1883.

Stroma consisting of an effused cottony subiculum, usually parasitic on other fungi; perithecia immersed or partially im-

mersed in the subiculum; asci cylindrical or clavate, 8-spored; spores fusiform, simple, smooth or externally roughened.

Type species: *Sphaeria viridis* Albert. & Schw.

Distinguished from *Hypomyces* by the simple spores.

Stroma dirty greenish.	1. *P. viridis.*
Stroma not greenish.	
Spores comparatively small, 15–20 mic. long.	
Stroma lemon-yellow.	2. *P. camphorati.*
Stroma white, becoming pallid or latericeous.	3. *P. lateritia.*
Spores comparatively large, 30 mic. or more long.	
Spores broad fusiform, rough, apiculate.	
Stroma dull orange; on *Cantharellus.*	4. *P. transformans.*
Stroma pallid.	5. *P. Banningiae.*
Spores narrow fusiform, smooth, non-apiculate.	6. *P. hymenii.*

1. PECKIELLA VIRIDIS (Albert. & Schw.) Sacc. Syll. Fung. 9: 944. 1891

Sphaeria viridis Albert. & Schw. Conspect. Fung. 8. 1805.

Hypomyces viridis Berk. & Broome, Ann. Mag. Nat. Hist. 15: 22. 1865.

Stroma effused, covering the hymenium and stem of the host, dirty greenish or greenish-black; perithecia thickly gregarious and immersed or partially immersed in the subiculum; asci cylindrical or slightly clavate, 8-spored, 175–180 × 5–6 mic.; spores 1-seriate or partially 2-seriate above, fusiform with a long apiculus at each end, 25–35 × 5 mic. becoming delicately verrucose, simple but occasionally appearing obscurely and irregularly septate (*pl. 21, f. 1*).

On the hymenium and stem of agarics, *Lactaria* and *Russula.*

TYPE LOCALITY: Europe.

DISTRIBUTION: New England to N. Carolina.

ILLUSTRATIONS: Albert. & Schw. Conspect. Fung. *pl. 6, f. 8;* Phill. & Plow. Grevillea 8: *pl. 130, f. 1;* Plow. Grevillea 11: *pl. 152, f. 2.*

SPECIMENS EXAMINED: Pennsylvania, *Everhart;* (Vermont?), *Burlingham.*

The species is distinguished externally by its dark greenish color and internally by the very large, rough, simple spores.

2. **Peckiella camphorati** (Peck)

Hypomyces camphorati Peck, Bull. N. Y. State Mus. **105**: 23. 1906.

Stroma consisting of a thin effused subiculum overspreading the hymenium of the host and obliterating the gills, forming an even layer, bright lemon-yellow sometimes slightly fading; perithecia numerous, small, immersed in the subiculum or with the ostiola slightly protruding, darker than the subiculum, pale brownish; asci cylindrical, 8-spored; spores 1-seriate, fusiform with a short apiculus at each end, occasionally blunt at both ends, smooth or very minutely rough, 15–20 × 4 mic., simple oozing out and forming a white powder over the surface of the stroma (*pl. 21, f. 6*).

On the hymenium of *Lactaria camphorata.*

TYPE LOCALITY: New York.

DISTRIBUTION: New York.

SPECIMENS EXAMINED: New York, *Peck* (type), *Murrill 2678.*

The spores of this species are similar in size and general appearance to those of *Peckiella lateritia* but the species is easily distinguished by its bright lemon-yellow stroma.

3. PECKIELLA LATERITIA (Fries) Maire, Ann. Myc. **4**: 331. 1906

Sphaeria lateritia Fries; Kunze, Myc. Heft. **2**: 42. 1823.

Hypomyces lateritius Tul. Ann. Sci. Nat. IV. **13**: 11. 1860.

Hypocrea lateritia Fries, Summa Veg. Scand. 383. 1849.

Hypomyces Vuilleminianus Maire, Bull. Herb. Boissier **7**: 138. 1899.

Hypomyces volemi Peck, Bull. Torrey Club **27**: 20. 1900.

Peckiella Vuilleminiana Sacc. & Sydow, Syll. Fung. **16**: 560. 1902.

Peckiella hymenioides Peck, Bull. Torrey Club **34**: 102. 1907.

Stroma effused, more or less cottony, forming an even layer on the hymenium and more rarely on the stem of the host, entirely obliterating the gills, at first white becoming pale yellow or yellowish-brown; perithecia thickly scattered, immersed or with the necks of the ostiola more or less prominent, darker than the subiculum, yellowish or brownish, ovate; asci cylindrical, 8-spored, of variable length often attaining a length of 200 mic.; spores fusiform, usually with a distinct apiculus at each end, unequal sided, at first smooth, becoming delicately verrucose,

hyaline or subhyaline, granular within, nucleate or pseudoseptate, 15–25 × 4–5 mic. (mostly 15–20 × 4–5 mic.) (*pl. 21, f. 5*).

On different species of gill fungi, especially *Lactariae*.

TYPE LOCALITY: Europe.

DISTRIBUTION: Vermont to Alabama.

ILLUSTRATIONS: Tul. Fung. Carp. 2: *pl. 30, f. 5.*

SPECIMENS EXAMINED: Alabama, *Earle;* Connecticut, *Earle, Thaxter;* N. Jersey, *Ellis;* Pennsylvania, *Everhart;* Vermont, *Burlingham.*

While this species is usually described as having 1-septate spores, there seems to be much difference of opinion on this point. Maire* states that he had described *Hypomyces Vuilleminianus* believing it to differ from *Hypomyces lateritius* in the absence of the septum of the spores. Having later collected the species commonly and finding the spores to be always non-septate, he began to suspect that the description of *Hypomyces lateritius* by Tulasne† was incorrect. This suspicion was later confirmed by the examination of the original specimen sent from the Museum of Paris. He therefore reunites *Hypomyces Vuilleminianus* Maire and *Hypomyces lateritius* (Fries) Tulasne and states that the spores are verrucose and non-septate. The difference of opinion as to the presence of the septum in the spores of this species seems to be due to the fact that the spore contents often separates toward either end giving a septate appearance.

Hypomyces volemi was described by Dr. Peck on *Lactaria volema* and the spores indicated as fusiform, 12–15 × 4 mic., and commonly 2-nucleate. I have examined the type of this species and can discover no character on which to separate it.

Peckiella hymenioides was described by the same author on *Lactaria uvida* and the spores described as simple, subfusiform, pointed or acute at each end, 12–15 × 4–5 mic. Cotype material of this species in good condition has been studied and I find that it conforms in every detail with European material which has been distributed under the name of *Hypomyces lateritius* (Fries) Tul.

Since making the above notes I have been permitted to examine

* Ann. Myc. 4: 331. 1906.

† Fung. Carp. 3: 63. 1865.

a specimen of *Sphaeria lateritia* Fries from the herbarium of Fries and this examination has confirmed the observations of Maire that the spores of this species are simple.

4. PECKIELLA TRANSFORMANS (Peck) Sacc. Syll. Fung. 9: 945. 1891

? *Hypomyces insignis* Berk. & Curtis; Berk. Jour. Linn. Soc. 9: 424. 1867.

Hypomyces transformans Peck, Ann. Rep. N. Y. State Mus. 29: 57. 1878.

Subiculum effused, variable in color, dull orange, ochraceous or brick-red; perithecia numerous, thickly scattered, subglobose, partially buried in the subiculum, with a prominent ostiolum, amber or orange; asci cylindrical, 8-spored; spores fusiform with an apiculus at each end, becoming somewhat rough, simple or with the endochrome obscurely divided, hyaline, 32–37 mic. long (*pl. 21, f. 4*).

On *Cantharellus cibarius,* which it transforms into an irregular mass.

TYPE LOCALITY: Sandlake, N. York.

DISTRIBUTION: New York to Massachusetts and Pennsylvania.

SPECIMENS EXAMINED: New York, *Peck* (cotype); Massachusetts, *Harkness;* Pennsylvania, *Everhart.*

The species quite closely resembles *Hypomyces Lactifluorum* (Schw.) Tul.

5. PECKIELLA BANNINGIAE (Peck) Sacc. Syll. Fung. 9: 945. 1891

Hypomyces Banningii Peck, Bot. Gaz. 4: 139. 1879.

Stroma white, then sordid, transforming the hymenium of the host; perithecia crowded, ovate, with a papilliform ostiolum, pale amber or dull yellow; asci cylindrical, slender, 8-spored; spores 1-seriate, fusiform, hyaline, white in mass, 30–35 × 5–6 mic. becoming delicately roughened externally, with a distinct apiculus at each end, simple (*pl. 21, f. 2*).

On decaying fungi apparently some *Lactaria.*

TYPE LOCALITY: Baltimore, Maryland.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Baltimore, *Miss Banning* (type).

Specimens from Pennsylvania referred to this name by Mr. Ellis are *Peckiella hymenii* Peck.

6. PECKIELLA HYMENII Peck, Bull. N. Y. State Mus. **116**: 28. 1907

Subiculum white, overrunning the hymenium of the host and obliterating the gills, sometimes interrupted, becoming yellowish with age; perithecia minute, ovate, immersed with the ostiola protruding, numerous, pale yellow, becoming darker with age; asci cylindrical, 8-spored; spores 1-seriate with ends overlapping, fusiform but not apiculate, straight or a little curved or double curved, simple, slender, 35–40 × 5 mic., oozing from the perithecia forming minute whitish masses upon them (*pl. 21, f. 4*).

On the hymenium of species of *Lactaria.*

TYPE LOCALITY: New York.

DISTRIBUTION: New York to Pennsylvania.

SPECIMENS EXAMINED: New York, *Peck* (type); Pennsylvania, *Everhart.*

The species is quite distinct in the slender, fusiform, non-apiculate spores.

30. HYPOMYCES (Fries) Tul. Ann. Sci. Nat. IV. **13**: 11. 1860

Hypomyces Fries, Syst. Orbis Veg. 105 (as possible genus). 1825.

Nectria Fries, Syst. Orbis Veg. 105 (as possible genus) in part. 1825.

Clintoniella (Sacc.) Rehm, Hedwigia **39**: 223. 1900.

Stroma consisting of an effused, cottony subiculum often of considerable extent (rarely subpatellate and subfleshy), occurring as a parasite on fleshy fungi or more rarely on old wood, rotten leaf mould and other substrata where there is no trace of other fungi; conidial phase variable, represented by species of *Sepedonium, Verticillium* (*Asterophora?*), etc.; perithecia numerous usually thickly scattered and immersed in the subiculum, rarely subsuperficial or with the necks more or less protruding; asci cylindrical, 8-spored; spores fusoid or fusiform, usually with an apiculus at each end or ends blunt, 1-septate, hyaline, smooth or rough.

TYPE SPECIES: *Sphaeria Lactifluorum* Schw.

Stromata orange, purple or rose-colored.
  Some shade of orange, occasionally purple with age.
    Entirely covering and transforming the hymenium of *Lactariae;* perithecia entirely immersed. 1. *H. Lactifluorum.*
    Forming interrupted patches on wood and fungi of various kinds.
      Stromata bright orange, fading with age; perithecia entirely immersed, occurring on wood, decaying leaves, etc. 2. *H. apiculatus.*
      Stromata dull orange or rust-colored, cottony; perithecia subsuperficial, on fungi of various kinds. 3. *H. aurantius.*
  Stroma delicately rose-colored, on wood, etc. 4. *H. rosellus.*
Stromata bright lemon-yellow, amber or pallid.
  Stroma bright lemon-yellow.
    Stroma yellow, cottony; perithecia reddish, immersed, on *Boleti.* 5. *H. chrysospermus.*
    Stroma and perithecia both lemon-yellow; perithecia subsuperficial. 6. *H. aureo-nitens.*
  Stroma dull yellow or pallid.
    Spores comparatively small, not over 20 mic. long.
      Spores unequally septate, rough. 7. *H. hyalinus.*
      Spores equally septate, smooth.
        On *Coriolus versicolor;* perithecia amber. 8. *H. polyporinus.*
        On wood and fungi of various kinds; spores showing a tendency to separate at the septum.
          Spores large, 18–20 mic. long; stroma subpatellate. 9. *H. citrinellus.*
          Spores small, 10 mic. long; stroma effused, papery. 10. *H. papyraceus.*
    Spores very large, 35 mic. long, rough. 11 *H. macrosporus.*

1. HYPOMYCES LACTIFLUORUM (Schw.) Tul. Ann. Sci. Nat. IV. 13: 11. 1860

Sphaeria Lactifluorum Schw. Schr. Nat. Ges. Leipzig 1: 31. 1822.

Hypomyces purpureus Peck, Bull. Torrey Club 25: 327. 1898.

Subiculum thin, effused, covering the hymenium and stem of the host and entirely obliterating the gills, bright orange, color changing to bright purple as the host decays; perithecia thickly scattered, immersed or with the necks slightly protruding, a little darker than the subiculum; asci very long, cylindrical, 8-

spored; spores 1-seriate with the ends overlapping, fusiform with an apiculus at each end, for the most part slightly curved or unequal sided, septate, with the septum in the center, hyaline and strongly roughened at maturity, 35–40 × 7–8 mic., oozing from the perithecia and forming a white powder over the surface of the stroma (*pl. 20, f. 3–5, and pl. 21, f. 7*).

Parasitic on species of *Lactaria*.

TYPE LOCALITY: N. Carolina.

DISTRIBUTION: Maine to N. Dakota and Alabama.

ILLUSTRATIONS: Ellis & Everhart, N. Am. Pyrenom. *pl. 11, f. 12–14;* Bull. N. Y. State Mus. 105: *pl. 103.*

EXSICCATI: Bartholomew; Ellis & Everhart, Fungi Columbiani *1734;* Ellis, N. Am. Fungi *467, 643;* Shear, N. Y. Fungi *89;* Wilson & Seaver Ascom. and Lower Fungi *34.* Other Specimens Examined: Alabama, *Earle;* Maine, *Murrill, 1854, 2040;* N. York, *Peck* (type of *H. purpureus*); N. Dakota, *Seaver;* N. Jersey, *Ellis;* Ohio, *Kelsey;* Pennsylvania, *Haines, Everhart & Wood;* S. Carolina, *Ravenel, Schweinitz* (type); Tennessee, *Murrill.*

Easily distinguished by its bright orange subiculum which entirely discolors the host. The change of color from orange to purple is a noteworthy feature.

2. **Hypomyces apiculatus** (Peck)

Hypocrea apiculata Peck, Ann. Rep. N. Y. State Mus. **29**: 57. 1878.

? *Hypomyces xylophilus* Peck, Bull. Torrey Club **11**: 28. 1884.

Clintoniella apiculata Sacc. Syll. Fung. **16**: 588. 1902.

Subiculum effused, soft, subfleshy, occurring in irregular patches, at first bright orange with the margin sterile and lighter, color very variable in dried specimens fading to pale orange, dull yellow and finally dirty whitish especially when exposed to the light; perithecia thickly scattered, immersed with the necks protruding, darker than the subiculum; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping, fusiform with an apiculus at each end, usually a little curved, 1-septate and slightly constricted, hyaline, 25–35 × 7–8 mic. becoming a little rough at maturity (*pl. 21, f. 8*).

On decaying leaves, wood, etc.

TYPE LOCALITY: Catskill Mts., New York.

DISTRIBUTION: New York to Virginia.

SPECIMENS EXAMINED: New York, *Peck* (cotype), *Seaver* (various collections); Virginia, *Murrill, 436, 437, 438, 439.*

The present species was not originally described as a *Hypomyces* since the plants do not occur on other fungi as is usually the case. Dr. Peck (l. c.) states: "The spores of *Hypocrea apiculata* resemble those of this (*Hypomyces transformans*) and other species of *Hypomyces* but the plant is not parasitic on fungi an essential character in the genus *Hypomyces* as at present defined." After examination of specimens collected by the writer and determined by Dr. Peck it was concluded that this species was a typical *Hypomyces* and a note from the same man later sustained me in this conclusion.

The genus *Clintoniella* (Sacc.) Rehm was based on this species and was distinguished from *Hypocrea* by the fusiform spores. The latter genus is therefore not well founded.

A specimen of *Hypomyces xylophilus* Peck, collected in Ohio by Morgan and which is apparently cotype has been studied. This appears to be a faded and rather poor specimen of the above species, which often occurs on wood and rubbish of various kinds.

3. HYPOMYCES AURANTIUS (Pers.) Tul. Ann. Sci. Nat. IV. 13: 12. 1860

Sphaeria aurantia Pers. Ic. et Descr. 2: 45. 1800.

Nectria aurantia Fries, Summa Veg. Scand. 388. 1849.

? *Diplocladium minor* Bon. Handbk. All. Myk. 98. 1851.

Subiculum effused, at first whitish, becoming orange or rust-colored, often covering an area of 5–8 cm. or in smaller, interrupted patches; perithecia thickly gregarious or crowded, orange, darker than the subiculum; subconical, with the ostiola strongly protruding, occasionally with the subiculum almost wanting in weathered specimens; asci cylindrical, 8-spored, with the spores slightly overlapping; spores fusiform, usually a little curved, with a medial septum and a short apiculus at each end, becoming strongly verrucose at maturity (*pl. 21, f. 9*).

On decaying fungi of various kinds.

TYPE LOCALITY: Europe.

DISTRIBUTION: Connecticut to Colorado and Cuba.

ILLUSTRATIONS: Pers. Ic. et Descr. **2**: *pl. 11, f. 4–5.*

SPECIMENS EXAMINED: Colorado, *Cockerell;* Connecticut, *Thaxter;* Cuba, *Earle* and *Murrill 500;* Iowa, *Seaver;* N. Dakota, *Seaver.*

4. HYPOMYCES ROSELLUS (Albert. & Schw.) Tul. Ann. Sci. Nat. IV. 13: 12. 1860

? *Sphaeria rosea* Pers. Syn. Fung. 18. 1801.

Sphaeria rosella Albert. & Schw. Conspect. Fung. 35. 1805.

Nectria Albertini Berk. & Broome, Ann. Mag. Nat. Hist. **7**: 14. 1861.

Nectria rosella Fries, Summa Veg. Scand. 388. 1849.

Hypomyces roseus Fuckel, Symb. Myc. 182. 1869.

Conidial phase (species of *Trichothecium* and *Dactylium*) forming an effused subiculum often covering an area of 3–8 cm., cottony, at first whitish becoming rose-colored, lighter near the sterile margin; conidia elliptical, hyaline, becoming 1–3-septate; perithecia thickly scattered, darker than the subiculum, nearly blood-red, partially immersed in the subiculum, with the protruding ostiolum acute or more or less obtuse, often collapsing; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping in the ascus, with an apiculus at each end, 1-septate, septum medial, hyaline becoming slightly rough at maturity, 20–30 × 5 mic. (*pl. 21, f. 10*).

On fungi, old wood and rubbish probably growing on the remains of decaying fleshy fungi.

TYPE LOCALITY: Germany.

DISTRIBUTION: Delaware to N. Dakota, Florida, Louisiana and the W. Indies.

ILLUSTRATIONS: Albert. & Schw. Conspect. Fung. *pl. 7, f. 3;* Tul. Fung. Carp. **2**: *pl. 30, f. 6–9.*

SPECIMENS EXAMINED: Delaware, *Commons;* Florida, *Martin;* Louisiana, *Langlois 2176;* Minnesota, *Holway;* N. Dakota, *Seaver;* Porto Rico, *Goll.*

The species is very distinct in its rose-colored subiculum and fusiform spores.

5. HYPOMYCES CHRYSOSPERMUS (Bull.) Tul. Ann. Sci. Nat. IV. 13: 16. 1855

Reticularia chrysosperma Bull. Herb. France *pl. 476, f. 4.* 1789.
Mucor chrysospermus Bull. Hist. Champ. 1: 99. 1809.
Uredo mycophila Pers. Obs. Myc. 16. 1796.
Sepedonium chrysospermum Fries, Syst. Myc. 3: 438. 1829.
Hypomyces boletinus Peck, Bull. N. Y. State Mus. 75: 15. 1905.

Conidial phase consisting of a golden or lemon-yellow powdery mass which covers the substratum often for several cm.; conidia globose, golden-yellow, beautifully but delicately echinulate, 15–18 mic. in diameter; perithecia gregarious or thickly crowded, nestling in the yellow subiculum, reddish or reddish-brown; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping in the ascus, fusiform, mostly curved, and becoming when mature slightly rough, 1-septate, with the septum near one end, dividing the spore into two unequal cells with the short cell toward the base, 12–15 × 4 mic. (*pl. 21, f. 16*).

On species of *Boletus.*

TYPE LOCALITY: France.

DISTRIBUTION: New York to Connecticut and Virginia.

ILLUSTRATIONS: Bull. Herb. France *pl. 476, f. 4;* Tul. Fung. Carp. 3: *pl. 8, f. 1–13.*

SPECIMENS EXAMINED: Connecticut, *Burlingham;* New York, *Peck* (type of *H. boletinus*), *Seaver, Galloway;* Virginia, *Murrill.*

Species very distinct with its bright yellow conidia and dark reddish perithecia. The spores in American forms examined are smaller than usually indicated for European specimens, however, as the spores are quite variable in size and other characters conform well it is likely that the American and European specimens are identical.

6. HYPOMYCES AUREO-NITENS Tul. Fung. Carp. 3: 64. 1865

Stroma effused, thin, bright golden or lemon-yellow overspreading the host often for a distance of 2 cm.; perithecia seated in the stroma, very much exserted or subsuperficial, thickly gregarious, often crowded, darker in color than the subiculum, ovate; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping, fusiform with the ends sharply pointed, 1-septate, with the septum medial, slightly constricted, 15–18 × 4 mic. (*pl. 21, f. 19*).

On old fungi, *Polyporus, Stereum.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Ohio.

ILLUSTRATIONS: Plowright, Grevillea **11**: *pl. 156.*

SPECIMENS EXAMINED: Ohio, *Morgan 19, 27, 37.* Also specimens from the herbarium of *Plowright.*

The spores are a little larger than indicated for the European specimens but otherwise they conform well.

7. HYPOMYCES HYALINUS (Schw.) Tul. Ann. Sci. Nat. IV. **13**: 11. 1860

Sphaeria hyalina Schw. Schr. Nat. Ges. Leipzig **1**: 30. 1822.

? *Hypomyces Van-Bruntianus* Gerard, Bull. Torrey Club **4**: 64. 1873.

Hypomyces inaequalis Peck, Bull. Torrey Club **25**: 328. 1898.

Peckiella hyalina Sacc. Syll. Fung. **9**: 945. 1891.

Subiculum effused, almost entirely covering the host which is often undeveloped, white, pallid or with a tinge of pink or brownish; perithecia thickly scattered, immersed or partially immersed in the subiculum or with the necks slightly protruding, darker than the subiculum, brownish or reddish-brown; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping, usually with a minute apiculus above, or occasionally obtuse, gradually tapering below, often slightly constricted and septate near the base, at first smooth, becoming strongly verrucose, septation less distinct in mature spores on account of the wart-like markings on the surface, constriction usually evident, 15–20 × 5–7 mic., hyaline or very faintly yellowish (*pl. 21, f. 12*).

Type on *Russula foetens,* also reported on various other agarics which are usually deformed and not easily determined.

TYPE LOCALITY: N. Carolina.

DISTRIBUTION: N. Carolina to Maine.

SPECIMENS EXAMINED: Maine, *Fox* (type of *H. inaequalis*); Massachusetts, *Sturgis;* N. Carolina, *Schweinitz* (type), *Murrill & House.*

The species is well distinguished by the spore characters. The above description was drawn from the type in the Schweinitz collection at Philadelphia.

In the herbarium of the N. Y. Botanical Garden is a letter

dated Sept. 5, 1893, and addressed to Mr. J. B. Ellis by Dr. W. C. Sturgis which reads as follows: "I enclose a specimen of what I take to be *Hypomyces hyalinus* Schw. on a species of *Agaricus* collected at Manchester, Mass. There would be no doubt about it were it not for the peculiarity in the spores. When mature they seem to be unequally uniseptate as in the genus *Stigmatea*. I thought I could distinguish the septum but it may be merely due to the absence of the warted surface plainly visible on the greater part of the spore surface. I would like your opinion on it."

This peculiarity I had already noticed and described in the spores of the type of *Hypomyces hyalinus* (Schw.) Tul., before finding the above note by Dr. Sturgis. I later compared the spores of the specimen collected by Sturgis with Schweinitz's type and find them identical.

Dr. C. H. Peck later described *Hypomyces inaequalis* and in a note stated: "The species is peculiar in having the septum of the spores near the base as in the spores of *Plowrightia morbosa*. This divides the spore into two unequal parts and suggests the specific name." In the type of this latter species the spores are not quite so strongly verrucose but show a tendency to become rough and there is no doubt of its identity.

The spores of *Hypomyces Van-Bruntianus* Gerard were described as follows: "Spores hyaline, oblong, shortly apiculate at the broad end and obtusish at the other, .0006 × .0002'" (15 × 5 mic.). I have examined a specimen of this species from the herbarium of Gerard but was unable to find spores in good condition for study. The general description of the spores indicate that it is a synonym of the above.

8. HYPOMYCES POLYPORINUS Peck, Bull. Buffalo Soc. Nat. Sci. 1: 71. 1874

Peckiella polyporina Sacc. Syll. Fung. 9: 945. 1891.

Subiculum effused, covering the hymenium of the host, entirely obliterating the pores, whitish or pale yellowish; perithecia numerous, thickly scattered or closely crowded, partially immersed in the subiculum, amber; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping, fusiform, mostly a little curved, smooth, 1-septate, 15–20 × 4–4.5 mic. (*pl. 21, f. 17*).

On the hymenium of *Coriolus versicolor.*

TYPE LOCALITY: New York.

DISTRIBUTION: N. York to N. Jersey and N. Dakota.

EXSICCATI: Ellis & Everh., N. Am. Fungi *1946;* N. Dakota Fungi *8;* Wilson & Seaver, Ascom. & Lower Fungi *35.* Other specimens examined: Canada, *Macoun;* N. Dakota, *Seaver* (various collections); N. York, *Peck* (type); N. Jersey, *Ellis.*

9. **Hypomyces citrinellus** (Ellis)

Hypocrea citrinella Ellis, Bull. Torrey Club **6**: 108. 1876.

Stromata subpatellate, gregarious or scattered, small, 1–2 mm. in diameter, fleshy or subfleshy, pale lemon-yellow, upper surface punctate with the protruding necks of the perithecia, becoming wrinkled in drying; asci cylindrical, 8-spored; spores 1-seriate, strongly overlapping, fusiform with the ends acute, 1-septate, strongly constricted at the septum, 18–20 × 4 mic., showing a tendency to become disjuncted at the septum, especially when removed from the ascus (*pl. 21, f. 14*).

On dead bark of *Vaccinium.*

TYPE LOCALITY: N. Jersey.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 11, f. 4, 5.*

SPECIMENS EXAMINED: N. Jersey, *Ellis* (type).

The stromata of this species are subpatellate and resemble very closely those of some of the common species of *Hypocrea.* This together with the fact that the spores sometimes break apart at the septum doubtless explains the reason for the species having been placed in the genus *Hypocrea* by Mr. Ellis. The spores are exactly those of a *Hypomyces* and since the stromata in this genus vary from cottony to fleshy we can scarcely do otherwise than to include the species with this genus. Mr. Ellis in a later description states:* "In the original description, the true character of the sporidia was overlooked, the specimens first found being rather old and the cells of the sporidia separated." He does not however remove it from the genus in which it was originally placed.

* Ellis & Everh. N. Am. Pyrenom. 87. 1892.

The occasional breaking apart of the two cells of the spores is also shown by another species, *Hypocrea papyracea* Ellis & Holw. but in the latter species the stroma is papery and effused. The tendency of the spores to separate at the septum seems to suggest a *Hypocrea* while the form of the spores is that of a *Hypomyces*, and the stromatic characters of the two species partakes as much of the one genus as the other. To me it seems best to place both species in the genus *Hypomyces* since the form of the spores would suggest a close relationship with the other species of this genus.

10. **Hypomyces papyraceus** (Ellis & Holw.)

Hypocrea papyracea Ellis & Holw. Jour. Myc. **2**: 66. 1886.

Stroma effused, consisting of a thin, membranaceous mycelial growth easily separable from the substratum, of a papery consistency, very pale yellow or whitish, 2–3 cm. in diameter; perithecia very minute, about 150 mic. in diameter, subsuperficial, reddish and appearing like minute specks on the surface of the stroma; asci cylindrical, 8-spored; spores 1-seriate with the ends overlapping, fusiform, 1-septate, strongly constricted at the septum and often disjuncted and the cells easily separating, especially when removed from the ascus, 10 × 2–3 mic. (*pl. 21, f. 15*).

On decaying wood and fungi.

TYPE LOCALITY: Iowa.

DISTRIBUTION: Iowa to Ohio.

SPECIMENS EXAMINED: Iowa, *Holway* (type); Ohio, *Morgan* (two collections).

A specimen received from Mr. Morgan of Ohio before his death as *Hypomyces* sp. nov. conforms well with the type of the above species. The species is well characterized by the paper-like consistence of the stroma as well as by the very small perithecia and the tendency exhibited by the spores to separate at the septum.

Hypomyces macrosporus sp. nov.

Stroma consisting of an effused subiculum entirely covering the hymenium of the host and obliterating the gills, pallid or pale ochraceous (in dried specimens), covered over with a pale yellow powder (spores); perithecia numerous and thickly scattered,

entirely immersed or with the ostiola slightly protruding, darker than the stroma; asci cylindrical, 8-spored; spores 1-seriate, strongly overlapping, fusiform, with an apiculus at each end, 1-septate, not constricted or constriction so slight as to be scarcely noticeable, strongly verrucose, hyaline or very pale yellowish, 35–40 × 8–9 mic.

On some gill fungus.

TYPE LOCALITY: Alabama.

DISTRIBUTION: Known only from type locality.

EPECIMENS EXAMINED: Alabama, *Earle & Baker.*

From various descriptions this was at first thought to be *Hypomyces ochraceus* (Pers.) Tul. A note from Leiden however states that there is no material of *Sphaeria ochracea* Pers. to be found in Persoon's herbarium. This species was originally reported as terrestrial while our specimens are parasitic on gill fungi. In the absence of type material it is impossible to state what Persoon's specimens really were but the descriptions usually represent them as having large, smooth, strongly constricted spores. The spores of the present species conform well in size but differ in being unconstricted and strongly verrucose. This together with its parasitic habits would seem to distinguish our species from Persoon's.

DOUBTFUL SPECIES

Hypomyces sepulcralis Pat. Bull. Soc. Myc. France **18**: 179. 1902.

Stroma crustaceous, irregular, white to pale ochraceous, thin; perithecia subglobose, partially immersed, brown, closely gregarious, ostiola conical, protruding; asci cylindrical, narrow, 120–150 × 5–6 mic., 8-spored; spores 1-seriate, fusoid, hyaline, not appendiculate, smooth or a little rough, 1-septate, and not constricted at the septum, 10–14 × 4–5 mic.

On the ground in a cemetery.

According to the author of the species similar to *H. terrestris* Plow. & Boud.

Hypocrea viridans Berk. & Curtis; Berk. Jour. Linn. Soc. **10**: 376. 1869.

Scarcely a line across, composed of thick cylindrical, branched, gelatinous threads; spores 2-seriate, fusiform, narrow, .00057 inch long.

On leaves of *Gesneria.* No specimen seen.

Hypomyces asterophorus Tul. Fung. Carp. 3: 55. 1865. Perfect fruit not known from N. America.

Sphaeria boleticola Schw. Trans. Am. Phil. Soc. II. 4: 210. 1832. No specimen could be found in the Schweinitz collection at Philadelphia.

Hypomyces ochraceus (Pers.) Tul. Ann. Sci. Nat. IV. 13: 12. The specimens of this species reported from N. America do not conform with the original description. No specimen of the type could be found at Leiden.

Hypomyces apiosporus Cooke, Grevillea 12: 80. 1884. No specimen at Kew. Description suggests *Hypomyces hyalinus* (Schw.) Tul.

Hypomyces tegillum Berk. & Curtis, Grevillea 4: 15. 1875. Described from immature material.

31. HYPOCREOPSIS Karsten, Myc. Fenn. 2: 251. 1873

Dozya Karsten, Myc. Fenn. 2: 28. 1873 (homonym).

Stroma tubercular, fleshy, effused, lobate or stellate, superficial; perithecia immersed; asci 8-spored; spores elliptical, usually 1-septate, hyaline, cells not separating.

TYPE SPECIES: *Sphaeria riccioidia* Bolton.

Distinguished from *Hypocrea* by the 8-spored asci.

Stroma stellately lobed or branched.	1. *H. lichenoides.*
Stroma not stellately branched or lobed.	
Stroma effused, on *Tremella.*	2. *H. tremellicola.*
Stroma patellate, on dead wood.	3. *H. consimilis.*

1. **Hypocreopsis lichenoides** (Tode)

Acrospermum lichenoides Tode, Fung. Meckl. 1: 9. 1790.
Sphaeria riccioidia Bolton, Fungi Halifax 4: 182. 1791.
Sphaeria parmelioides Mont. Ann. Sci. Nat. II. 6: 333. 1836.
Hypocrea parmelioides Mont. Syll. 210. 1856.
Hypocrea riccioidea Berk. Outl. Brit. Fungi 383. 1860.
Dozya riccioidea Karst. Myc. Fenn. 2: 221. 1873.
Hypocreopsis riccioidea Karst. Myc. Fenn. 2: 251. 1873.
Hypocrea digitata Ellis & Everh. Jour. Myc. 1: 42. 1885.

Stroma radiating from a common center and consisting of several much-divided branches or lobes which extend entirely

around the substratum; lobes 2–3 mm. in diameter and subcylindrical, closely appressed and covering the substratum for a distance of 5 cm., color yellowish, becoming brown or brownish-black with age, upper surface roughened by the slightly protruding necks of the perithecia; perithecia immersed; asci cylindrical or slightly clavate, 8-spored, 80–90 × 12 mic.; spores elliptical, ends obtuse, a little curved, 1-septate, not constricted, hyaline, 25 × 10 mic. (*pl. 20, f. 1–2*).

On partially decayed branches.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: N. Hampshire.

ILLUSTRATIONS: Bolton, Fungi Halifax 4: *pl. 182;* Ellis & Everh. N. Am. Pyrenom. *pl. 11, f. 1–3;* E. & P. Nat. Pfl. 1[1]: *f. 244 A.;* Tode, Fungi Meckl. *pl. 2, f. 15.*

SPECIMENS EXAMINED: N. Hampshire, *Miss Minns.*

The species is very distinct in the finger-like branching of the stroma.

2. **Hypocreopsis tremellicola** (Ellis & Everh.)

Hypocrea tremellicola Ellis & Everh. N. Am. Pyrenom. 85. 1892.

Stroma effused, more or less cottony, covering the host; perithecia numerous, immersed with the ostiola slightly protruding, darker than the subiculum; asci cylindrical, 8-spored, 60–75 mic. long; spores 1-seriate, elliptical, slightly smaller toward the base, hyaline, 1-septate, 7–8 × 3 mic.

On *Tremella albida.*

TYPE LOCALITY: Ohio.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Ohio, *Morgan* (type).

In color and general appearance of the stroma this species resembles *Hypocrea latizonata* Peck but differs in that the asci are 8-spored instead of 16-spored.

3. **Hypocreopsis consimilis** (Ellis)

Hypocrea consimilis Ellis, N. Am. Fungi *158.*

Stroma orbicular or elliptical, convex, 2–3 mm. in diameter, brick-red, wrinkled, fleshy; asci clavate to cylindrical, 60–70 × 3.5–4 mic.; spores 1-seriate, hyaline, 10–12 × 3.5–4 mic.

On dead *Azalea viscosa.*

TYPE LOCALITY: N. Jersey.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 11, f. 8–9.*

EXSICCATI: Ellis, N. Am. Fungi *158.*

32. OOMYCES Berk. & Broome, Ann. Mag. Nat. Hist. **7**: 185. 1851

Coscinaria Ellis & Everh. Jour. Myc. **2**: 88. 1886.

Perithecia few, vertical, contained in a membranaceous sac-like structure; asci cylindrical, 8-spored; spores filiform, continuous, hyaline, as long as the ascus.

TYPE SPECIES: *Sphaeria carneo-alba* Libert.

1. OOMYCES LANGLOISII Ellis & Everh. Jour. Myc. **2**: 88. 1886

Coscinaria Langloisii Ellis & Everh. N. Am. Pyrenom. 69. 1892.

Stroma tuberculiform, erumpent, fleshy, .3–.5 mm. in diameter, pale carneus or horn-colored when fresh, becoming nearly black when dry, of a rather close membranaceous texture on the surface, softer within, surrounded by the ruptured epidermis, convex above; perithecia ovate, minute, with thin, transparent walls, 250–300 × 150–200 mic.; asci cylindrical, 150–200 × 5 mic.; spores filiform, as long as the ascus, hyaline, continuous, 1 mic. thick.

On dead stems of *Vigna luteola.*

TYPE LOCALITY: Louisiana.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 17, f. 5–9.*

SPECIMENS EXAMINED: Louisiana, *Langlois* (type).

33. BARYA Fuckel, Symb. Myc. 93. 1869

Perithecia fleshy, becoming hard in drying, seated in a loose cottony conidia bearing mycelium; conidia oblong, obscurely 1-septate, obtuse at the ends; asci elongated, lanceolate, tapering above and below, with a globose apex; spores filiform, simple, about as long as the ascus, hyaline.

TYPE SPECIES: *Barya parasitica* Fuckel.

BARYA PARASITICA Fuckel. Symb. Myc. 93. 1869

Perithecia gregarious almost crowded yellowish-white, surrounded at the base with a white mycelial growth giving the

whole cluster which is about 3 or 4 mm. in diameter a decidedly whitish appearance; perithecia ovoid, tapering into a rather long neck, almost flask-shaped, rough, 200 × 325 mic.; asci at first very slender tapering above, with a knob-like structure at the apex, becoming broader as they mature, about 200 × 5–6 mic.; 8-spored; spores filiform, nearly as long as the ascus, simple.

On *Bertia moriforms* on wood and (decaying material?) on the ground.

TYPE LOCALITY: Europe.

DISTRIBUTION: New York.

ILLUSTRATIONS: Fuckel. Symb. Myc. *pl. 4, f. 18;* Peck, Ann. Rep. N. Y. State Mus. 43: *pl. 4, f. 13* to *17;* Winter, Rabenh. Krypt. Fl. 1²: 84, *f. 1–4.*

SPECIMENS EXAMINED: New York City, *Seaver.*

The above description is from a specimen collected by the author on Sept. 24, 1906, in a swampy place in New York City. The specimen when collected, looked decidedly white to the unaided eye and consisted of a rather dense cluster of perithecia about 3 or 4 mm. in diameter, each perithecium surrounded by a white mycelial growth and the whole cluster growing on some kind of decaying material on the ground. The specimen differs a little from Fuckel's description in that the perithecia are of a dirty yellowish-white instead of yellowish-green and in the habitat. But since it was impossible to determine from the specimen collected, the kind of material on which the plants were growing and as they conform very well in other characters they are referred to this name.

Our specimen is evidently the same as Mr. Peck's variety *cespitosa.** The asci are very long and are characterized by the knob-like structure at the apex. Fuckel describes the knob as being at the base of the ascus but Mr. Peck states that the knob is at the apex as it is also in our specimen. This mistake could easily occur however since when the asci are removed from the perithecia it is difficult to determine which is the apex and which the base. The asci in Fuckel's specimens are described as being 146 by 8 mic. The asci are variable in length but the measurements taken here show them to be as long as 200 mic. but the

* Peck, Ann. Rep. N. Y. State Mus. 43: 79. 1890.

immature asci are very much smaller. The spores are long and very slender and no septa could be distinguished. It is difficult to determine the number of spores when enclosed in the ascus but occasionally an ascus may be found broken with the thread-like spores protruding and in this case they may be easily counted. This species is probably rare.

34. TYPHODIUM Link, Abhandl. Akad. Wissensch. Berl. **1824**: 175. 1826

Epichloe (Fries) Tul. Fung. Carp. **3**: 24. 1865.

Stroma effused, subfleshy, at first pale becoming bright orange, forming rings or sheaths about the stems of grasses; perithecia immersed or with the ostiola protruding; asci cylindrical, 8-spored; spores filiform, many-septate.

TYPE SPECIES: *Sphaeria typhina* Pers.

1. **Typhodium typhinum** (Pers.)

Sphaeria typhina Pers. Ic. et Descr. **1**: 21. 1798.
Sphaeria spiculifera Sow. Engl. Fungi, *pl. 274*. 1803.
Dothidea typhina Fries, Syst. Myc. **2**: 553. 1822.
Stromatosphaeria typhina Greville, Scot. Fl. **4**: *pl. 204*. 1826.
Cordyceps typhina Fries, Summa Veg. Scand. 381. 1849.
Epichloe typhina Tul. Ann. Sci. Nat. IV. **13**: 18. 1860.

Stroma effused, subfleshy, at first pale, becoming bright orange, forming sheaths 2–5 cm. in length, about the stems of various grasses; conidia elliptical, hyaline, 4–5 × 3 mic.; perithecia thickly scattered, partially to entirely immersed, soft, membranaceous, similar in color to the stroma, with a rather prominent ostiolum; asci cylindrical, very long, 8-spored; spores nearly as long as the ascus, in a close fascicle, about 2 mic. in diameter, many-septate (*pl. 20, f. 17–18*).

On living grasses: *Agropyron divergens, Agropyron occidentale, Calamagrostis canadensis, Dactylis glomerata, Elymus virginicus, Hystrix hystrix, Koeleria cristata, Panicularia nervata* and *Stipa* sp.

TYPE LOCALITY: Europe.

DISTRIBUTION: N. York to Washington and Mexico.

ILLUSTRATIONS: Greville, Scot. Crypt. Fl. *pl. 204;* Pers. Ic. et Descr. **1**: *pl. 7, f. 1;* Sow. Engl. Fungi *pl. 274*.

EXSICCATI: Ellis & Everh. N. Am. Fungi *185;* Griffiths, W. Am. Fungi, *19, 185;* Wilson & Seaver, Ascom. & Lower Fungi, *80.* Other specimens examined: Delaware, *Commons;* Florida, *Tracy;* Iowa, *Holway;* Missouri, *Galloway;* N. York, *Clinton;* Mexico, (*Holway?*); Ohio, *Morgan;* S. Dakota, *Griffiths,* Washington, *Piper;* Wisconsin, *Davis.*

The hosts cited above are given on the authority of the collectors as the specimens in most cases are not sufficient for determination of the host. Mr. Peck also reports the species on *Carex* sp.

HYPOCRELLA Sacc. Michelia 1: 322. 1878

Stromata patellate or effused, bright colored, often becoming darker with age, fleshy; perithecia immersed or with the ostiola slightly protruding; asci cylindrical, 8-spored; spores filiform, often many-septate and occasionally separating into segments.

TYPE SPECIES: *Hypocrea discoidea* Berk. & Broome.

Hypocrella Tamoneae Earle sp. nov.

Stromata scattered, hypophyllous, 1–1.5 mm. in diameter, black (at least in aged specimens), suborbicular, crust-like, superficial; perithecia crowded, prominent, finally collapsing, 200–250 mic. in diameter; ostiola perforate, large, somewhat irregular; asci cylindrical, short-stipitate, 80–100 × 7–8 mic.; spores thread-like, very slender, equalling in length the ascus, spirally coiled, about 80 × .75 mic.; paraphyses numerous.

On living leaves of *Tamonea* sp.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Porto Rico, *Underwood & Griggs* (type).

DOUBTFUL SPECIES

Hypocrella Sloaneae Pat. Duss. Enum. Champ. Guadel & Mart. 80. 1903.

Stromata ochraceous, whitish, hemispherical, 2–5 mm. in diameter, covered with the perithecia; perithecia exserted, ovoid of the same color with the ostiola brownish; asci elongated, 12–15 mic. in diameter; spores filiform, soon breaking into fusoid segments; segments hyaline, 9–12 × 2–3 mic.

On the under surface of leaves of a *Sloanea.*

Hypocrella phyllogena (Mont.) Speg., Duss. Enum. Champ. Guadel. & Mart. 80. 1903.

Pulvinate, hemispherical, base constricted, orange; perithecia peripheral, erect, ovate, ostiola punctiform, bright purple, nestling in a stroma of similar color; spores filiform, breaking into segments.

On leaves of *Myrcia octopleura.*

A specimen of this species from the herbarium of Patouillard is sterile.

EXCLUDED SPECIES

Hypocrella atramentosa (Berk. & Curt.) Sacc.
Hypocrella Hyphoxylon (Peck) Sacc.

DOUBTFUL GENERA

GLAZIELLA Berk. Vidensk. Medd. Nat. For. Kjoben. 1879–80: 31

"Stroma subglobosum laeticolor; perithecia pallida, gelatina repleta."

TYPE SPECIES: *Glaziella vesiculosa* Berk.

GLAZIELLA AURANTIACA (Berk. & Curt.) Sacc. Syll. Fung. 2: 582. 1883

Xylaria aurantiaca Berk. & Curtis, Jour. Linn. Soc. 10: 382. 1868.

"Subglobosa, inflata, aurantiaca, polita, subtus pallidior, ostiolis impressis."

"On the ground in woods without apparent attachment. The specimens are unfortunately not mature, but the species belongs to the same category as *X. compuncta.*"

The species is bright orange in color the dried specimens becoming much faded. The structure resembles the thin skin of some fruit and is filled with glands which have been described as perithecia.

A specimen of this species was first referred to the writer by Prof. L. M. Underwood having been collected by him as a fungus. Owing to the absence of fruit it was impossible to determine the species and, in fact, we were not entirely convinced that it was a fungus although sections seemed to show mycelial structure.

In the winter of 1908 other specimens of the same species were collected in Jamaica by Dr. W. A. Murrill. During the winter of 1909 in working over the Hypocreales in the collections of the N. Y. Botanical Garden a specimen was found in the Ellis collection (*Cockerell No. 49*) labeled *Hypomyces alboluteus* Ellis & Everh. To this packet was attached a note stating that it was typical *Glaziella aurantiaca* Berk. & Curtis according to Massee. Although somewhat faded in color the specimen is identical with specimens collected in the West Indies by Prof. L. M. Underwood and Dr. W. A. Murrill. This species has also been recently collected in Santo Domingo by Mr. Norman Taylor.

EXPLANATION OF PLATE 20

1–2. *Hypocreopsis lichenoides* (Tode) Seaver. 1, gross characters, natural size; 2, portion of ascus with spores, × 350.

3–5. *Hypomyces Lactifluorum* (Schw.) Tul. 3, a gill fungus infected with the parasite, natural size; 4, section through the stroma showing perithecia, partially diagrammatic; 5, ascus with spores, × 350.

6–8. *Hypocrea rufa* (Pers.) Fries. 6, plants natural size; 7, section through the stroma showing perithecia; 8, ascus with spores, × 350.

9–10. *Hypocrea latizonata* Peck. 9, two plants of *Cyathus striatus* infected with the parasite, natural size; 10, ascus with spores, × 350.

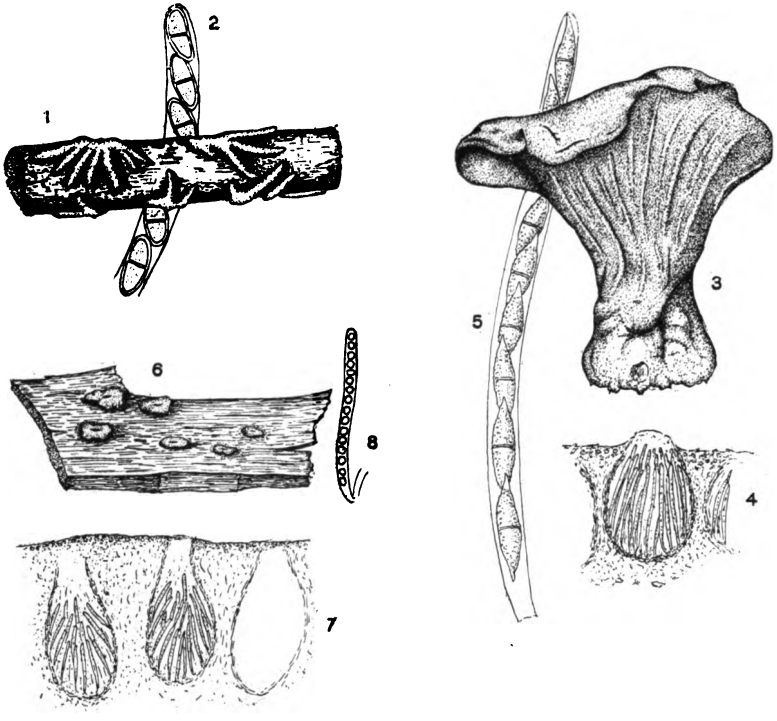
11–13. *Chromocrea gelatinosa* (Tode) Seaver. 11, several plants natural size; 12, ascus with spores, × 350; 13, a single plant enlarged.

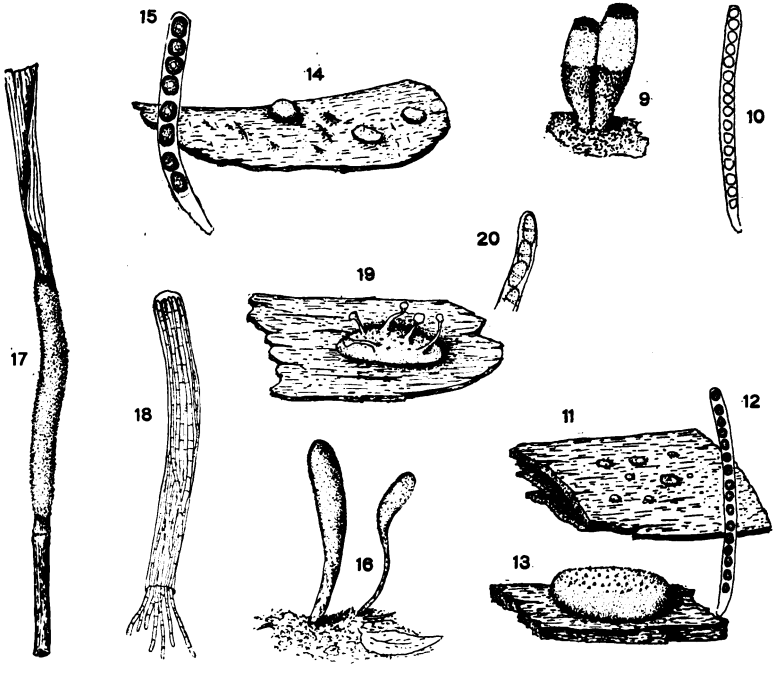
14–15. *Chromocreopsis cubispora* (Ellis & Holw.) Seaver. 14, several plants natural size; 15, ascus with spores, × 350.

16. *Podostroma alutaceum* (Pers.) Atk. Two plants natural size.

17–18. *Typhodium typhinum* (Pers.) Seaver. 17, stem of grass infected with the parasite; 18, portion of ascus with spores, × 350.

19–20. *Stilbocrea intermedia* (Ferd. & Winge) Seaver. 19, plant enlarged; 20, portion of ascus with spores, × 350.





HYPOCREAE

EXPLANATION OF PLATE 21

The spores on this plate were drawn with the aid of the camera lucida, the object being to show the comparative size and form of the spores of the different species of *Hypomyces* and *Peckiella,* × 500. The drawings are from type material where such material is available. In a few cases this could not be obtained.

1. *Peckiella viridis* (Albert. & Schw.) Sacc.
2. *Peckiella Banningiae* (Peck) Sacc. Drawn from type material.
3. *Peckiella transformans* (Peck) Sacc. Drawn from cotype.
4. *Peckiella hymenii* Peck. Drawn from type material.
5. *Peckiella lateritia* (Fries) Maire. Drawn from material obtained from the herbarium of Fries and doubtless determined by him.
6. *Peckiella camphorati* (Peck) Seaver. Drawn from type material.
7. *Hypomyces Lactifluorum* (Schw.) Tul. Drawn from type material.
8. *Hypomyces apiculatus* Peck. From fresh material determined by Dr. Peck.
9. *Hypomyces aurantius* (Pers.) Tul. From herbarium material.
10. *Hypomyces rosellus* (Albert. & Schw.) Tul. From herbarium material.
11. *Hypomyces macrosporus* Seaver. From type material.
12. *Hypomyces hyalinus* (Schw.) Tul. Drawn from type material.
13. *Hypomyces aureo-nitens* Tul. Drawn from Ohio material.
14. *Hypomyces citrinellus* (Ellis) Seaver. Drawn from type material.
15. *Hypomyces papyraceus* (Ellis & Holw.) Seaver. From type.
16. *Hypomyces chrysospermus* (Bull.) Tul. From herbarium material.
17. *Hypomyces polyporinus* Peck. Drawn from cotype material.

SPORES OF PECKIELLA AND HYPOMYCES

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THE HYPOCREALES OF NORTH AMERICA—IV

Tribe IV. CORDYCIPITEAE

FRED J. SEAVER

(WITH PLATES 53 AND 54, CONTAINING 26 FIGURES)

Sclerotia formed in the bodies of insects or in the stems of plants, consisting of a more or less well-developed, often compact and hard mycelial tissue; stromata developing from the sclerotia usually after a period of rest, erect and clavate or rarely pulvinate; perithecia immersed or subsuperficial (especially in aged specimens); asci cylindric; spores filiform or subfiliform, simple or many-septate, often breaking into numerous segments, hyaline.

Sclerotia formed in the bodies of insects or fruiting organs of fungi.	36. CORDYCEPS.
Sclerotia formed in the tissues of vascular plants.	
Sclerotia originating in the ovaries of plants; stromata long-stipitate.	37. SPERMOEDIA.
Sclerotia formed in the stems or fruiting axes of plants; stromata short-stipitate or sessile.	38. BALANSIA.

36. CORDYCEPS (Fries) Link, Handb. 3: 347. 1833

Sphaeria §*Cordyceps* Fries, Syst. Myc. 2: 323. 1823.
Torrubia Lev.; Tul. Fung. Carp. 3: 5. 1865.

Stromata springing from the sclerotium or resting stage of the fungus composed usually of compact mycelial tissue within the bodies of insects or more rarely in other fungi, simple or branched,

at first (*Isaria* stage) often delicate, producing conidia, later usually clavate, producing perithecia, which are more or less immersed or more rarely subsuperficial, collected into a globose, clavate, or agariciform head supported by a sterile stem, or sometimes surmounted by a sterile apex; asci cylindric, 8-spored; spores filiform or subfiliform, many-septate and often breaking into segments in the ascus, or more rarely simple and entire.

Type species, *Clavaria militaris* L.

Sclerotia formed in the bodies of insects or larvae.
- Perithecia collected into a definite, enlarged head, usually immersed.
  - Stromata large, several cm. high.
    - Occurring on larvae or pupae.
      - Head fertile to the tip.
        - Head clavate.
          - Stromata bright-orange; on pupae. — 1. *C. militaris.*
          - Stromata brownish; on larvae.
            - Spore segments short, 1.5 mic. in length. — 2. *C. palustris.*
            - Spore segments long, 3–5 mic. in length.
              - Plants stout; spore segments 4–5 mic. in length. — 3. *C. Ravenelii.*
              - Plants slender; spore segments 3.5 mic. in length. — 4. *C. acicularis.*
        - Head globose or subglobose.
          - Plants purplish. — 5. *C. insignis.*
          - Plants yellowish.
            - Spore segments 4 mic. in length. — 6. *C. flavella.*
            - Spore segments 6–8 mic. in length. — 7. *C. entomorrhiza.*
      - Head with a sterile apex.
        - Plants stout, yellowish; on white grubs. — 8. *C. herculea.*
        - Plants slender, brownish; on larvae. — 9. *C. stylophora.*
    - Occurring on adult insects (wasps). — 10. *C. sphecocephala.*
  - Stromata small, less than 1 cm. high.
    - Spores much shorter than the ascus, fusoid; on scale-insects. — 11. *C. clavulata.*
    - Spores nearly as long as the ascus, filiform; not on scale-insects.
      - Plants 3 mm. high, reddish-purple. — 12. *C. Langloisii.*
      - Plants 5–9 mm. high, yellowish. — 13. *C. armeniaca.*

Perithecia scattered, becoming subsuperficial.	
Stromata very long and slender, 5 cm. high.	14. *C. Sphingum.*
Stromata 1 cm. or less high.	
Stromata effuse or erect; perithecia becoming spathulate when dry.	15. *C. Cockerellii.*
Stromata erect; perithecia flask-shaped.	16. *C. isarioides.*
Sclerotia formed in fungi.	
Stromata agariciform.	17. *C. agariciformia.*
Stromata clavate.	18. *C. parasitica.*

1. CORDYCEPS MILITARIS (L.) Link, Handbk. 3: 347. 1833

Clavaria militaris L. Sp. Pl. 1182. 1753.

Ramaria farinosa Holmsk. Danske Vid-Selsk. Skr. II. 1: 299. 1781.

Clavaria granulosa Bull. Herb. *Fr. pl. 496, f. 1.* 1790.

Clavaria farinosa Dicks. Pl. Crypt. Brit. 2: 25. 1790.

Isaria farinosa Fries, Syst. Myc. 3: 271. 1832.

Kentrosporium militare Wallr. Beitr. Bot. 166. 1844.

Torrubia militaris Tul. Fung. Carp. 3: 6. 1865.

Sclerotia formed in the pupae of insects, compact, white; conidial stage (*Isaria*) rising from the sclerotium, consisting of a slender stalk, and a white, floccose, feather-like head; stromata at maturity consisting of a sterile stem and fertile, clavate head, usually simple but more rarely forked or branched, the whole often attaining a height of 4–5 cm., but often much shorter, bright-orange; perithecia thickly scattered or crowded, for the most part immersed with the necks protruding, or superficial (especially in weathered specimens); asci cylindric; spores filiform, nearly as long as the ascus, many-septate, breaking apart at the septa, giving rise to numerous subellipsoid segments 2–3 mic. long (*pl. 53, f. 10, 11*).

On pupae buried or partially buried in the ground.

TYPE LOCALITY: Europe.

DISTRIBUTION: Massachusetts to North Dakota and Virginia; also in Europe.

ILLUSTRATIONS: Bull. Herb. Fr. *pl. 496, f. 1;* Fl. Dan. *pl. 657, f. 1;* Sow. Engl. Fungi *pl. 60; pl. 308.*

SPECIMENS EXAMINED: Connecticut, *Earle;* Iowa, *Seaver;* Massachusetts, *Morris;* North Dakota, *Seaver* (*Isaria* stage only); New York, *Murrill, Seaver;* New Jersey, *Ellis;* Pennsylvania, *Small;* Vermont, *Burlingham;* Virginia, *Murrill.*

2. CORDYCEPS PALUSTRIS Berk & Br.; Berk. Jour. Linn. Soc. 1: 159. 1857

Stromata 1–3 cm. high; stem 3–4 mm. thick, simple or divided into 2–4 short branchlets, even, smooth, brown; head 1–2 cm. long, thicker than the stem, cylindic-ovoid, dull brownish-purple or flesh-colored, minutely rough with the slightly protruding necks of the perithecia; asci elongate, narrowly cylindric, capitate, tapering below into a long, slender pedicel; spores arranged in a parallel fasicle, slightly curved, filiform, hyaline, becoming many septate, 100–120 × 1 mic., the segments 1.5 mic. long (*pl. 54, f. 5*).

On moist rotten logs, growing from the larvae of some coleopterous insect.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Jour. Linn. Soc. 1: *pl. 1.*

Berkeley in his original description of this species says: "The extremely minute articulations or sporidiola, without any other character, separate this curious species which has moreover a peculiar habit."

3. CORDYCEPS RAVENELII Berk. & Curt.; Berk. Jour. Linn. Soc. 1: 159. 1857

Stromata usually solitary, 3–8 cm. high, consisting of a sterile stem and fertile head; stem 2–5 cm. long, grooved or furrowed, brownish, becoming nearly black on drying, about 2–3 mm. in diameter; fertile head terminal or more rarely with a sterile apex or with the perithecia in patches, with bare, sterile spaces between; perithecia partially immersed, becoming almost entirely superficial, giving the fertile portions a very rough appearance, similar in color to the stem; asci very long, cylindric; spores filiform, nearly as long as the ascus, breaking into segments 4–5 mic. long (*pl. 54, f. 10*).

Springing from the larvae of coleopterous insects.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina to Pennsylvania (and Iowa?).

EXSICCATI: Rav. Fungi Car. 4: *28.* Other specimens examined: Pennsylvania, *Everhart.*

According to Massee, this species has been collected in Texas by Wright, also in California by Harkness and is known in the western states as the "white grub fungus." While the species

seems to have been frequently collected but few specimens are available for examination.

4. CORDYCEPS ACICULARIS Rav.; Berk. Jour. Linn. Soc. 1: 158. 1857

? *Torrubia Melolonthae* Tul. Fung Carp. 3: 12. 1865.

? *Torrubia superficialis* Peck, Ann. Rep. N. Y. State Mus. 28: 70. 1857.

? *Cordyceps Melolonthae* Sacc. Michelia 1: 320. 1878.

Stem simple, elongate, slender, cylindric, often flexuous, brownish, minutely velvety at the base, smooth above, 5–8 cm. high and 1.5 mm. thick; head cylindric, about 1.5 cm. long and 3 mm. thick; perithecia blackish, large, ovoid, subsuperficial; asci subcylindric, capitate at the apex, with a short pedicel below; spores arranged in a parallel fascicle in the ascus, hyaline, filiform, straight or curved, many-septate, 130 × 2.5 mic.; segments 3.5 mic. long (*pl. 54, f. 9*).

On larvae buried in the ground.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina (and New York?).

ILLUSTRATIONS: Jour. Linn. Soc. 1: *pl. 1;* Ann. Bot. 9: *pl. 2, f. 27, 28.*

EXSICCATI: Rav. Fungi Car. 4: *29* (as *Cordyceps carolinensis* Berk. & Rav.).

Berkeley says: "This species is closely allied to *C. Ravenelii* but the habit is very different. I can find no essential difference in the fruit."

Massee also regards *C. Ravenelii* as scarcely more than a variety of the present species.

Mr. Peck (l. c.) states that *T. superficialis* is "related to and intermediate between *T. Ravenelii* and *T. carolinensis.*" It is not unlikely that a more extended study will show the three species to be identical.

5. CORDYCEPS INSIGNIS Cooke & Rav.; Cooke, Grevillea 12: 38. 1883

Stromata 4–6 cm. long, purple; stem 7–8 mm. thick, equal, pallid, sulcate (when dry), very minutely velvety at the base; head broadly ovoid, 1.5 cm. in length, very slightly roughened by the

necks of the slightly protruding perithecia; asci narrowly cylindric, slightly constricted below the capitate apex, narrowed below into a slender stem-like base; spores arranged in a parallel fasicle, slightly twisted, hyaline, filiform, many-septate, wavy when free, 170–180 × 15 mic., separating readily into segments in the ascus; segments 6–7 mic. long.

On larvae on the ground.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Known only from the type locality.

6. CORDYCEPS FLAVELLA Berk. & Curt.; Berk. Jour. Linn. Soc. 10: 375. 1868

Stromata gregarious, 3–5 springing from nearly the same point; stem 2.5–3 cm. long, about 1 mm. thick, straight or more or less curved or flexuous, even and smooth; head globose, roughened by the necks of the protruding perithecia, 2 mm. in diameter, similar in color to the stem; asci elongate, narrowly cylindric, capitate at the apex, narrowed below into a slender pedicel; spores arranged in a fascicle, filiform, many-septate, 80 × 1 mic.; component cells about 4 mic. long.

Growing from a caterpillar.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATIONS: Ann. Bot. 9: *pl. 2, f. 7–10.*

7. CORDYCEPS ENTOMORRHIZA (Dicks.) Link, Handbk. 3: 347. 1833

Sphaeria entomorrhiza Dicks. Pl. Crypt. Brit. 1: 22. 1785.

Xylaria gracilis Grev. Scot. Crypt. Fl. *pl. 86.* 1823.

Torrubia entomorrhiza Tul. Fung. Carp. 3: 14. 1865.

Cordyceps Menesteridis Muell. & Berk.; Berk. Gard. Chron. II. 10: 791. 1878.

Stromata consisting of a sterile stem and a subglobose fertile head; stem very slender, 2–8 cm. long, yellowish; head 5–8 × 4 mm., golden-yellow, darker with age, roughened by the prominent necks of the perithecia; perithecia ovoid, immersed or partially immersed; asci cylindric, 6.5–7 mic. thick; spores filiform, many-septate, hyaline, finally separating into segments 6–8 mic. long (*pl. 53, f. 7*).

On larvae of insects.

TYPE LOCALITY: Europe.

DISTRIBUTION: South Carolina; also in Europe, Asia, Africa, and Australia.

ILLUSTRATIONS: Dicks. Pl. Crypt. Brit. *pl. 3, f. 3;* Gard. Chron. II. **10**: 791, *f. 130;* Tul. Fung. Carp. **3**: *pl. 1, f. 12–14;* Grev. Scot. Crypt. Fl. *pl. 86.*

8. CORDYCEPS HERCULEA (Schw.) Sacc. Syll. Fung. **2**: 577. 1883.

Sphaeria herculea Schw. Trans. Am. Phil. Soc. II. **4**: 188. 1832.

Stromata large, attaining a height of 5–7 cm.; stem yellowish or tan-colored; head enlarged and more than 1 cm. thick, with the fertile portion often interrupted, leaving bare patches and in the specimens examined terminated by a short, obtuse apex; fertile portion roughened by the slightly prominent necks of the perithecia; asci cylindric, as long as 200–225 mic.; spores filiform, nearly as long as the ascus, many-septate, separating into joints 6–8 mic. (*pl. 53, f. 6*).

On larvae (white grubs).

TYPE LOCALITY: Salem, North Carolina.

DISTRIBUTION: Connecticut to Ohio and North Carolina.

SPECIMENS EXAMINED: Ohio, *Morgan;* Georgetown, D. C., *Billings.*

9. CORDYCEPS STYLOPHORA Berk. & Br.; Berk. Jour. Linn. Soc. **1**: 158. 1857

Stromata solitary, dull-brownish, consisting of a sterile stem and fertile head, with a long sterile apiculus, the entire plant 2–3 cm. high; stem straight or flexuous, more or less velvety, longitudinally wrinkled when dry; fertile head slightly roughened by the protruding perithecia; sterile apiculus 1 cm. or more long, asci cylindric or slightly constricted below the capitate apex; spores arranged in a fascicle, filiform, curved when free, many-septate, 125–135 × 1 mic.; segments 3.5 mic. long (*pl. 54, f. 1*).

On larvae in rotten logs.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Michigan and South Carolina.

ILLUSTRATIONS: Jour. Linn. Soc. **1**: *pl. 1;* Ann. Bot. **9**: *pl. 2, f. 40–42.*

EXSICCATI: Rav. Fungi Car. **5**: 49.

10. CORDYCEPS SPHECOCEPHALA (Klotzsch) Massee, Ann. Bot. 9: 13. 1895

Sphaeria sphecocephala Klotzsch; Berk. Lond. Jour. Bot. 2: 206. 1843.

Torrubia sphecocephala Tul. Fung. Carp. 3: 18. 1865.

Cordyceps sphecophila Berk. & Curt.; Berk. Jour. Linn. Soc. 10: 376. 1868.

Stromata 2–5 cm. high, consisting of a slender, sterile stem and a fertile head; stem pale-yellow, fibrous, often slightly twisted, 0.5–1 mm. thick; head enlarged, clavate, 5–8 mm. in length and 1.5–2 mm. in thickness, roughened by the slightly protruding necks of the perithecia; perithecia immersed, scattered, prominent; asci very long, cylindric; spores nearly as long as the ascus, breaking into fusoid segments 9–10 mic. long (*pl. 54, f. 3–4*).

Springing from the bodies of wasps.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies.

ILLUSTRATIONS: Tul. Fung. Carp. 3: *pl. 1, f. 5–9.*

SPECIMENS EXAMINED: Cuba (specimen given by *Mel. T. Cook*); also collected by *N. L. Britton* and *Percy Wilson.*

11. CORDYCEPS CLAVULATA Schw. Trans. Am. Phil. Soc. II. 4: 188. 1832

Cordyceps pistillariaeformis Berk. & Br. Ann. Mag. Nat. Hist. III. 7: 451. 1861.

Torrubia pistillariaeformis Cooke, Handbk. Brit. Fungi 771. 1871.

Torrubia clavulata Peck, Ann. Rep. N. Y. State Mus. 28: 70. 1876.

Sclerotia formed in the bodies of dead scale-insects; stromata slender, clavate, at first sterile, at maturity with an enlarged, clavate, fertile head and a slender, sterile stem, the whole 3–4 mm. high, 3–8 springing from a single sclerotium; stem slender, 1–2 mm. long, grayish or cinereous; head thicker, darker in color and strongly roughened by the protruding necks of the perithecia; asci clavate, broader near the middle, 80–100 × 8–10 mic.; spores much elongate, subfiliform, broader near the base and tapering toward either end, 7–8-septate about 50–80 mic. long, 3 mic. thick at the broadest point, hyaline (*pl. 53, f. 1–5*).

On dead scale-insects on the branches of various kinds of trees and shrubs.

TYPE LOCALITY: Bethlehem, Pennsylvania.

DISTRIBUTION: New York and New Jersey to North Dakota.

ILLUSTRATIONS: Ann. Mag. Nat. Hist. III. 7: *pl. 16, f. a–c;* Ellis & Everh. N. Am. Pyrenom. *pl. 15, f. 11–13.*

EXSICCATI: Ellis & Everh. N. Am. Fungi *2814.* Other specimens examined: Delaware, *Commons;* New York, *Peck;* North Dakota, *Seaver;* Ontario, *Dearness.*

12. CORDYCEPS LANGLOISII Ellis & Everh. N. Am. Pyrenom. 62. 1892

Stromata solitary, simple, consisting of a sterile stem and a subglobose head, the entire plant about 3 mm. high; stem 1 mm. thick, cylindric or subcompressed; head capitate, at first white, becoming reddish-purple, the upper convex surface fertile; perithecia tough-membranaceous, ovoid-conic, 100–150 × 200–300 mic., partially immersed in the stroma; asci very long, subcylindric; spores filiform, interwoven, nearly as long as the ascus, less than 0.5 mic. thick.

On dead larvae of the mason wasp.

TYPE LOCALITY: St. Martinsville, Louisiana.

DISTRIBUTION: Known only from the type locality.

SPECIMENS EXAMINED: Louisiana, *Langlois* (type).

13. CORDYCEPS ARMENIACA Berk. & Curt.; Berk. Jour. Linn. Soc. 1: 158. 1857

Stromata solitary or 2 or 3 springing from nearly the same point, 5–9 mm. high, consisting of a sterile stem and a fertile head; stem about 1 mm. thick, often flexuous and twisted, pale orange with a tinge of pink; head subglobose, 2–3 mm. in diameter, apricot-colored, roughened by the slightly protruding necks of the perithecia; asci long, cylindric-clavate, capitate, with a slender pedicel below; spores in a fascicle, slightly curved when free, filiform, becoming many-septate, 80–85 × 1 mic., breaking into segments 3 mic. long (*pl. 54, f. 2*).

On the excrement of birds (probably containing insect remains).

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina.

ILLUSTRATIONS: Jour. Linn. Soc. 1: *pl. 1, f. 1;* Ann. Bot. 9: *pl. 2, f. 18.*

14. CORDYCEPS SPHINGUM (Schw.) Berk. & Curt.; Berk. Jour. Linn. Soc. 10: 375. 1868

Isaria Sphingum Schw. Schr. Nat. Ges. Leipzig 1: 126. 1822.
Torrubia Sphingum Tul. Fung. Carp. 3: 12. 1865.

Stromata numerous, as many as thirty often springing from a single sclerotium, very slender and thread-like, about 5 cm. high and 1 mm. in thickness, cinereous, smooth or slightly pruinose, enlarged at the base, more or less bent above; perithecia subsuperficial, subconic, 125–150 × 200–225 mic., brownish; asci elongate, cylindric; spores filiform, as long as the ascus, about 2 mic. thick (*pl. 54, f. 11*).

On dead larvae in cocoon.

TYPE LOCALITY: North Carolina.

DISTRIBUTION: New Jersey to North Carolina.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 15, f. 4–7;* Tul. Fung. Carp 3: *pl. 1, f. 1, 2.*

SPECIMENS EXAMINED: New Jersey, *Ellis.*

15. CORDYCEPS COCKERELLII (Ellis & Everh.) Ellis; Cockerell, Jour. Inst. Jamaica 1: 180. 1893

Ophionectria Cockerellii Ellis & Everh.; Ellis, Jour. Inst. Jamaica 1: 141. 1892.

Stromata effuse, spreading over and almost covering the substratum, or erect and 1–2 mm. high, yellow; perithecia occurring in cespitose rounded or irregular clusters, or scattered, subsuperficial or nestling in the substratum; individual perithecia elongate, flask-shaped or cylindric, about 1 mm. high and 0.5 mm. in diameter, reddish-brown or slightly translucent, smooth, at maturity collapsing laterally, becoming spathulate in form; asci very slender, about 1 mic. thick, breaking up into short segments (*pl. 54, f. 6–8*).

On the body of a sphingid moth.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

SPECIMENS EXAMINED: Bath, Jamaica, *Mrs. Swainson* (Type).

This species, which is said by Professor Cockerell to occur on a sphingid moth, is similar in perithecial and spore characters to *C. Sphingum.* The stromata in this species, however, are effuse or very short while in *C. Sphingum* they are very long and slender. This may be only a variation of the former species.

16. CORDYCEPS ISARIOIDES M. A. Curtis.; Massee, Ann. Bot. 9: 36. 1895

Stromata gregarious, springing from a dense, white mycelium which almost entirely covers the host, 4–8 mm. high, about 1.5 mm. thick, cylindric, almost smooth, even, ochraceous (when dry), sometimes slightly curved; fertile portion 3–6 mm. long, cylindric, obtuse, axial portion not thicker than the stem; perithecia subsuperficial, large, flask-shaped, with elongate necks, ochraceous, crowded, spreading on all sides at right angles to the axis; asci narrowly cylindric slightly capitate, the base narrowed into a slender pedicel; spores filiform, continuous, flexuous when free, hyaline, 125–135 × 1.5 mic., arranged in a parallel fascicle in the ascus (*pl. 54, f. 12*).

Growing from the remains of a moth.

TYPE LOCALITY: United States.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Ann. Bot. 9: *pl. 2, f. 36–39.*

17. CORDYCEPS AGARICIFORMIA (Bolt.) Seaver, N. Am. Fl. 3: 53. 1910

Sphaeria agariciformia Bolt. Hist. Fung. 130. 1789.

Clavaria capitata Holmsk. Topsv. 38. 1790.

Cordyceps capitata Link, Handbk. 3: 347. 1833.

Torrubia capitata Tul. Fung. Carp. 3: 22. 1865.

Cordyceps canadensis Ellis. & Everh. Bull. Torrey Club 25: 501. 1898.

Cordyceps nigriceps Peck, Bull. Torrey Club 27: 21. 1900.

Stromata occurring singly or in clusters of several each, 3–8 cm. high, consisting of a sterile stem and an ovoid or capitate, fertile head; stem uniform in thickness or a little thicker below, fibrous, yellowish, becoming nearly black (in dried specimens), smooth; head ovoid or agariciform, about 1 cm. in diameter, reddish-brown, becoming nearly black, roughened by the slightly protruding necks of the perithecia; perithecia immersed, but prominent; asci very long, cylindric, about 15 mic. thick; spores filiform, nearly as long as the ascus, finally breaking into segments, subhyaline, fusoid or oblong-ellipsoid, with the ends rounded, 20–40 × 4–5 mic.

Parasitic on *Scleroderma* (?) and *Elaphomyces.*

TYPE LOCALITY: England.

DISTRIBUTION: Maine to Ontario and Florida.

ILLUSTRATIONS: Bolt. Hist. Fung. *pl. 130;* Tul. Fung. Carp. 3: *pl. 2, f. 10–15;* Pers. Myc. Eur. 1: *pl. 10, f. 1–3.*

EXSICCATI: Rav. Fungi Am. *387*; Rav. Fungi Car. 5: *48.* Other specimens examined: Delaware, *Commons;* Florida, *Calkins;* Maine, *Miss White;* Massachusetts, *Britton;* New Jersey, *Ellis.*

18. CORDYCEPS PARASITICA (Willd.) Seaver, N. Am. Fl. 3: 53. 1910

Clavaria parasitica Willd. Fl. Berol. 405. 1787.

Clavaria radicosa Bull. Herb. Fr. *pl. 440, f. 2.* 1789.

Sphæria ophioglossoides Ehrh.; Pers. in Holmsk. Coryph. 144. 1797.

Sphaeria radicosa DC. Fl. Fr. 2: 283. 1805.

Cordyceps ophioglossoides Link, Handb. 3: 347. 1833.

Torrubia ophioglossoides Tul. Fung. Carp. 3: 20. 1865.

Stromata solitary or very rarely cespitose, consisting of a slender, sterile stem and an enlarged, clavate, fertile head; stem olivaceous, longitudinally striate, becoming very dark colored in dried specimens, sending out numerous branching root-like fibers which surround the substratum and extend for some distance into the surrounding soil; head clavate, much enlarged, tapering often both above and below, dark-brown, becoming nearly black on drying and roughtened by the protruding perithecia; perithecia thickly scattered, immersed or slightly protruding; asci very long, often 300 mic., and 8–10 mic. in diameter; spores filiform, nearly as long as the ascus, many-septate and often breaking into segments; segments short, a little longer than broad, about 3–4 × 2–3 mic. (*pl. 53, f. 12–13*).

On species of *Elaphomyces.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Ontario to Rhode Island and Virginia; also in Europe.

ILLUSTRATIONS: Willd. Fl. Berol. *pl. 7, f. 17;* Bull. Herb. Fr. *pl. 440, f. 2.*

SPECIMENS EXAMINED: Maine, *Harvey;* New Jersey, *Ellis;* New York, *Underwood;* Ontario, *Dearness;* Pennsylvania, *Haines, Everhart & Jefferies;* Rhode Island, *Farlow;* Virginia, *Murrill.*

DOUBTFUL SPECIES

Cordyceps albella Massee, Ann. Bot. 9: 39. 1895. The species was based on imperfectly developed material.

Cordyceps albida Berk. & Curt.; Cooke, Grevillea 12: 78. 1884. On crickets in Cuba. Mr. Cooke states: "Too imperfectly developed for description."

Cordyceps caloceroides Berk. & Curt.; Berk. Jour. Linn. Soc. 10: 375. 1868.

Cordyceps Cicadae (Miq.) Massee, Ann. Bot. 9: 38. 1895. *Isaria Cicadae* Miq. Bull. Sci. Phys. Nat. Néerl. 1838: 85. 1838. *Torrubia Miquelii* Tul. Fung. Carp. 3: 11. 1865. *Cordyceps Miquelii* Sacc. Michelia 1: 320. 1878. This species, which occurs on the larvae of *Cicada*, has been reported as occurring in the United States.

Cordyceps sobolifera (Hill.) Sacc. Michelia 1: 321. 1878. *Clavaria sobolifera* Hill.; W. Wats. Phil. Trans. 53: 271. 1764. *Torrubia sobolifera* Tul. Fung. Carp. 3: 10. 1865. *Sphaeria sobolifera* Berk. Lond. Jour. Bot. 2: 207. 1843. On larvae of *Cicada*. Massee reports this species as occurring in the West Indies (*pl. 54, f. 13*).

37. SPERMOEDIA Fries, Syst. Myc. 2: 268. 1822

Sphacelia Lév. Mem. Soc. Linn. Paris 5: 578. 1827.

Kentrosporium Wallr. Beitr. Bot. 163. 1844.

Claviceps L. Tul. Compt. Rend. Acad. Sci. Paris 33: 646. 1851.

Sclerotia formed in the inflorescence of various grasses and sedges, at first consisted of a soft mass of mycelium which produces conidia often accompanied with a saccharine fluid, at maturity hard, subglobose subcylindric or horn-shaped, purplish-black externally, white within; stromata developing from sclerotium after a period of rest, consisting of a sterile stem and fertile head; head subglobose, grayish, reddish-brown, or yellowish margin often partially free; perithecia flask-shaped, immersed in the stroma or with the necks slightly protruding; asci cylindric, usually capitate, 8-spored; spores filiform, nearly as long as the ascus simple, hyaline.

Type species: *Sclerotium Clavus* DC.

Little is known of the species of this genus. The following is a list of those which have been recognized for North America.

Sclerotia subcylindric, horn-shaped, or clavate.	
Sclerotia in the inflorescence of grasses.	
Sclerotia purplish-black.	
Sclerotia large, 1–2 cm. long.	1. *S. Clavus.*
Sclerotia small, not more than 5 mm. long.	2. *S. microcephala.*
Sclerotia cinereous.	3. *S. cinerea.*
Sclerotia formed in the inflorescence of sedges.	4. *S. nigricans.*
Sclerotia subglobose, or conical.	
Occurring on *Paspalum.*	
Perithecia 340 × 119 mic.	5. *S. Stevensii.*
Perithecia 816 × 225 mic.	6. *S. Rolfsii.*
Occurring on *Tripsacum dactyloides.*	7. *S. Tripsaci.*

1. SPERMOEDIA CLAVUS (DC.) Fries, Syst. Myc. **2**: 268. 1822

Sclerotium Clavus DC. Fl. Fr. **6**: 115. 1815.

Sphaeria purpurea Fries, Syst. Myc. **2**: 325. 1823.

Sphacelia Segetum Lev. Mem. Soc. Linn. Paris **5**: 578. 1827.

Claviceps purpurea L. Tul. Ann. Sci. Nat. III. **20**: 45. 1853.

Sclerotia formed in the young ovaries of various species of grasses, at first soft and viscid, at maturity hard, purplish-black externally, whitish within, 1–2 cm. long; stromata often as many as 20–30 from a single sclerotium; stem very slender, flexuous or spirally twisted and of a dark-brownish color; head subglobose with the margin partially free, about 1–2 mm. in diameter, reddish-brown in color and roughened by the slightly protruding necks of the perithecia; perithecia entirely immersed or very slightly protruding, flask-shaped, 150–175 × 200–250 mic.; asci very long, cylindric, 100–125 × 4 mic.

In the inflorescence of rye, and of other wild and cultivated grasses.

TYPE LOCALITY: France.

DISTRIBUTION: New York to Montana and Utah, and probably throughout North America; also in Europe.

ILLUSTRATIONS: Ann. Sci. Nat. III. **20**: *pl. 1, 2, 3;* Rab. Krypt. Fl. **1**[2]: *f. 1–5;* E. & P. Nat. Pfl. **1**[1]: *f. 247, B–L.*

EXSICCATI: Ellis & Everh. Fungi Columb. *1614, 1816, 2216, 1327;* D. Griff. W. Am. Fungi *42;* Brenckle, Fungi Dak. *4.* Other specimens examined: Colorado, *Tracy;* Kansas, *Bartholomew;* Montana, *Anderson, Kelsey;* Ohio, *Craig;* Wisconsin, *Davis, Pammel, T. A. Williams.*

2. SPERMOEDIA MICROCEPHALA (Wallr.) Seaver, N. Am. Fl. 3: 55. 1910

Kentrosporium microcephalum Wallr. Beitr. Bot. 164. 1844.
Sphaeria microcephala Wallr. Beitr. Bot. 164, as syn. 1844.
Claviceps microcephala L. Tul. Ann. Sci.Nat. III. **20**: 49. 1853.

Sclerotia not exceeding 5 mm. in length; apparently differing from the preceding species only in the smaller size of the sclerotia and stromata.

In the inflorescence of various grasses; American specimens on *Calamagrostis* seem to conform with descriptions of this species.

TYPE LOCALITY: Europe.

DISTRIBUTION: North Dakota; also in Europe.

ILLUSTRATIONS: Wallr. Beitr. Bot. *pl. 3, f. 10–16;* Ann. Sci. Nat. III. **20**: *pl. 4, f. 1–11.*

EXSICCATI: Brenckle, Fungi Dak. *4.*

3. SPERMOEDIA CINEREA (D. Griff.) Seaver, N. Am. Fl. 3: 55. 1910

Claviceps cinereum D. Griff. Bull. Torrey Club **28**: 240. 1901.

Sclerotia clavate, gradually tapering upwards, straight, curved, twisted, or contorted, 1.5–3 cm. long and 1.75–2.5 mm. thick at the base, very viscid while developing, the base permanently invested by the flowering glumes of the host, dark-gray at the base, gradually fading to very light-gray or almost white at the apex; stromata erect, erumpent; stem cylindric or slightly fusiform, short, stout, almost white; head slightly flattened below and overlapping the upper end of the stalk, 2–3 mm. in diameter, light-gray, almost smooth, viscid, covered with small, darker points indicating the position of the perithecia; perithecia immersed, ovoid or subovoid, 190–225 × 60–90 mic.; asci narrowly cylindric, slightly narrowed below into a rather long, stout pedicel and slightly enlarged at the point of attachment, 135–150 × 4–5 mic.

Growing on the inflorescence of species of *Hilaria.*

TYPE LOCALITY: Cochise, Arizona.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bull. Torrey Club **28**: 238, *f. 1–2.*

EXSICCATI: D. Griff. W. Am. Fungi *97.*

4. SPERMOEDIA NIGRICANS (Tul.) Seaver, N. Am. Fl. 3: 55. 1910

Claviceps nigricans Tul. Ann. Sci. Nat. III. **20**: 51. 1853.

Sclerotia formed in the inflorescence of the host, 3–5 in a single spikelet, subcylindric or curved, often slightly flattened, brownish to purplish-black externally, white within, longitudinally striate; stromata not seen in American specimens.

On species of spike-rush (*Eleocharis*).

TYPE LOCALITY: Europe.

DISTRIBUTION: North Dakota and South Dakota; also in Europe.

ILLUSTRATIONS: Ann. Sci. Nat. III. **20**: *pl. 4, f. 15–22.*

EXSICCATI: D. Griff. W. Am. Fungi *10.* Other specimens examined: North Dakota, *Brenckle.*

5. **Spermoedia Stevensii** nom. nov.

? *Sclerotium Paspali* Schw. Schr. Nat. Ges. Leipzig **1**: 268. 1822.

? *Spermoedia Paspali* Fries, Syst. Myc. **2**: 268. 1822.

Claviceps Paspali Stevens & Hall, Bot. Gaz. **50**: 462. 1910.

Sclerotia yellowish to gray, globose, roughened when mature, about 3 mm. in diameter; head dull yellow; stipe short to medium usually not more than 1 cm. long; perithecia completely covering the head, numerous, ovoid, 340 × 119 mic.; asci cylindric, 174 mic. long; spores filiform, 101 × 0.5–1 mic.

On species of *Paspalum.*

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bot. Gaz. **50**: 460, *f. 1,* and 461, *f. 2, 3, 5.*

6. **Spermoedia Rolfsii** (Stevens & Hall)

Claviceps Rolfsii Stevens & Hall, Bot. Gaz. **50**: 462. 1910.

Sclerotia yellowish to gray, globose, roughened when mature, about 3 mm. in diameter; head dull yellow; stipe filiform, 1–1.5 cm. long; perithecia few in head and mostly upon extreme distal portion, cylindric-ovate, 816 × 225 mic.; asci cylindric, 375 × 3 mic.; spores filiform, 260–275 × 0.5–1 mic.

On species of *Paspalum.*

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bot. Gaz. **50**: 461, *f. 3, 4.*

7. **Spermoedia Tripsaci** (Stevens & Hall)

Claviceps Tripsaci Stevens & Hall, Bot. Gaz. **50**: 463. 1910.

Sclerotia smooth, white to dark brown or black, nearly conical, 4–5 mm. in diameter at the base; heads gray to grayish-white; stipe thick, white to purplish-white, 1–1.5 cm. long; perithecia numerous, ellipsoid in longitudinal section, with a short beak toward the surface of the head, 390 × 153–187 mic.; asci cylindric, 145–175 × 2–3 mic.; spores filiform 130 mic. long; conidia hyaline, continuous, fusoid to lunulate, 17.4–37.7 × 2.9–8.7 mic.

On gama grass, *Tripsacum dactyloides* L.

TYPE LOCALITY: North Carolina.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bot. Gaz. **50**: 462, *f.* 6.

DOUBTFUL SPECIES

Claviceps ? caricina D. Griff. Bull. Torrey Club **29**: 300. 1902. This is said to be *Sclerotium sulcatum* Desm. (See Mycologia **3**: 38. 1911.)

38. BALANSIA Speg. Anal. Soc. Ci. Argent. **19**: 45. 1885.

? *Ephelis Fries,* Summa Veg. Scand. 370. 1849.

? *Ophiodothis* Sacc. Syll. Fung. **2**: 652. 1883.

Dothichloe Atk. Bull. Torrey Club **21**: 223. 1894.

Sclerotia consisting of a more or less compact fungous tissue formed in the stems or inflorescence of plants; stromata arising from the sclerotium, stipitate and capitate or sessile, separated from the sclerotium by a constriction; perithecia immersed in the stroma; asci 8-spored; spores filiform, nearly as long as the ascus.

Type species: *Balansia claviceps* Speg.

1. BALANSIA HYPOXYLON (Peck) Atk. Jour. Myc. **11**: 254. 1905

? *Ephelis mexicana* Fries; Berk. Jour. Linn. Soc. **10**: 353. 1868.

Epichloe Hypoxylon Peck, Ann. Rep. N. Y. State Mus. **27**: 108. 1875.

Hypocrella Hypoxylon Sacc. Syll. Fung. **2**: 581. 1883.

? *Ephelis borealis* Ellis & Ev. Jour. Myc. **1**: 86. 1885.

Dothichloe Hypoxylon Atk. Bull. Torrey Club **21**: 223. 1894.

Sclerotia formed in the fruiting axes of the host, curved and

irregular, 1 cm. or more in length, grayish or blackish; stromata black, prominent, pulvinate or subhemispheric, 1–5 mm. in diameter, several springing from the same sclerotium, minutely roughened by the slightly protruding perithecia; perithecia immersed; asci cylindric, with a pedicel at the base, as much as 20 mic. in length; spores 1 mic. thick, at maturity breaking into segments 3–4 mic. long.

On *Danthonia spicata* (L.) Beauv., and other grasses.

TYPE LOCALITY: Sandlake, New York.

DISTRIBUTION: Maine to South Carolina, Texas and Iowa.

ILLUSTRATIONS: Jour. Myc. **11**: *pl. 81, 82, 38.*

EXSICCATI: Ellis & Everh. N. Am. Fungi *2373.* Barth. Fungi. Columb. *3027.* Other specimens examined: Connecticut, *Sheldon;* Iowa, *Buchanan;* Nova Scotia, *Dearness.*

DOUBTFUL SPECIES

Balansia discoidea P. Henn. Hedwigia Beibl. **39**: 77. 1900. Doubtfully reported from North America.

DOUBTFUL GENUS

USTILAGINOIDEA Bref. Unters. Gesammt. Myk. **12**: 194. 1895.

The imperfect stage of this fungus resembles a smut and the perfect stage is said to be similar to *Spermoedia;* the genus has been placed in the Hypocreales by Lindau. *Ustilaginoidea Oryzae* (Pat.) Bref. loc cit., commonly known as the green smut of rice, is reported as occurring in Louisiana. No specimens have been seen.

NEW YORK BOTANICAL GARDEN.

EXPLANATON OF PLATE 53

Figs. 1–5. *Cordyceps clavulata* Schw. Figs. 1–3 after Berkeley and Curtis.

Fig. 1. Two plants on scale-insect, natural size.

Fig. 2. Scale-insect with a number of sterile plants.

Fig. 3. Scale-insect with mature plants.

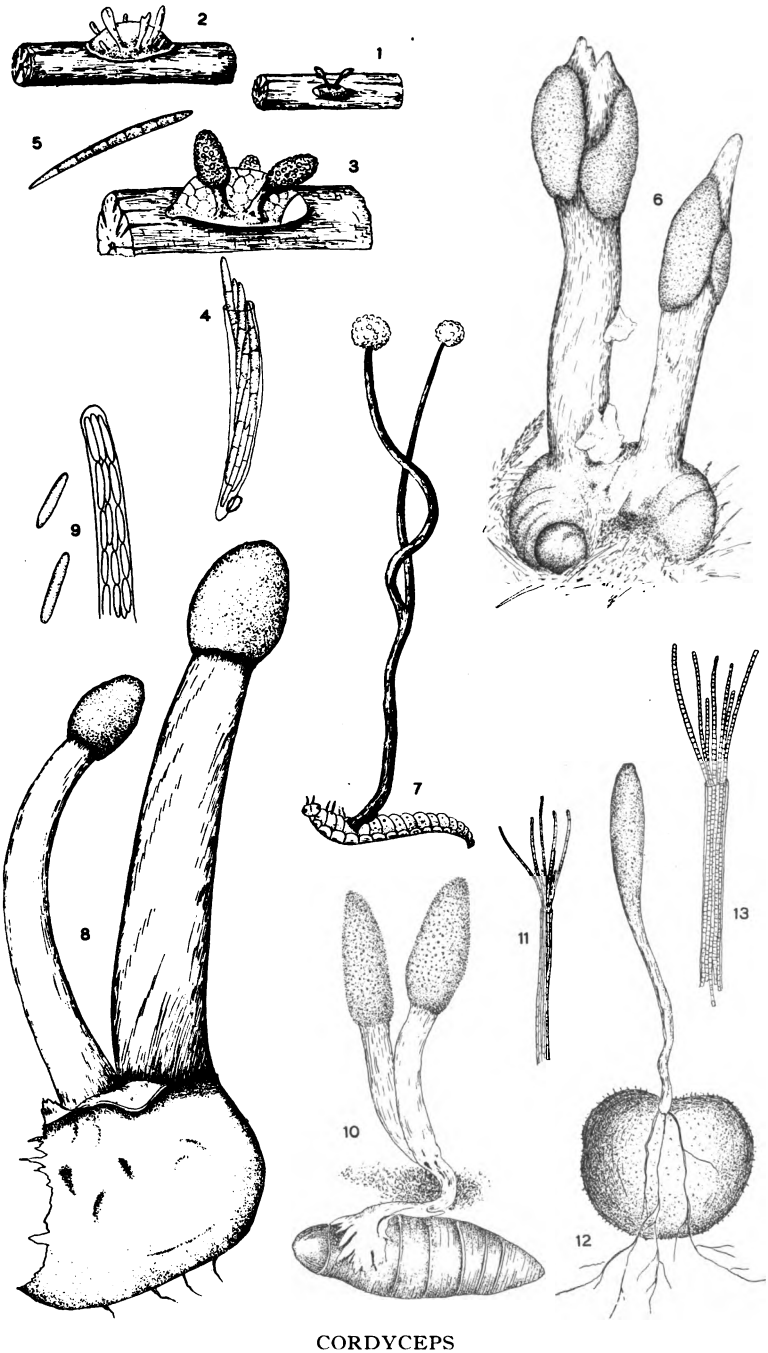
Fig. 4. Ascus with spores.

Fig. 5. One spore removed from ascus.

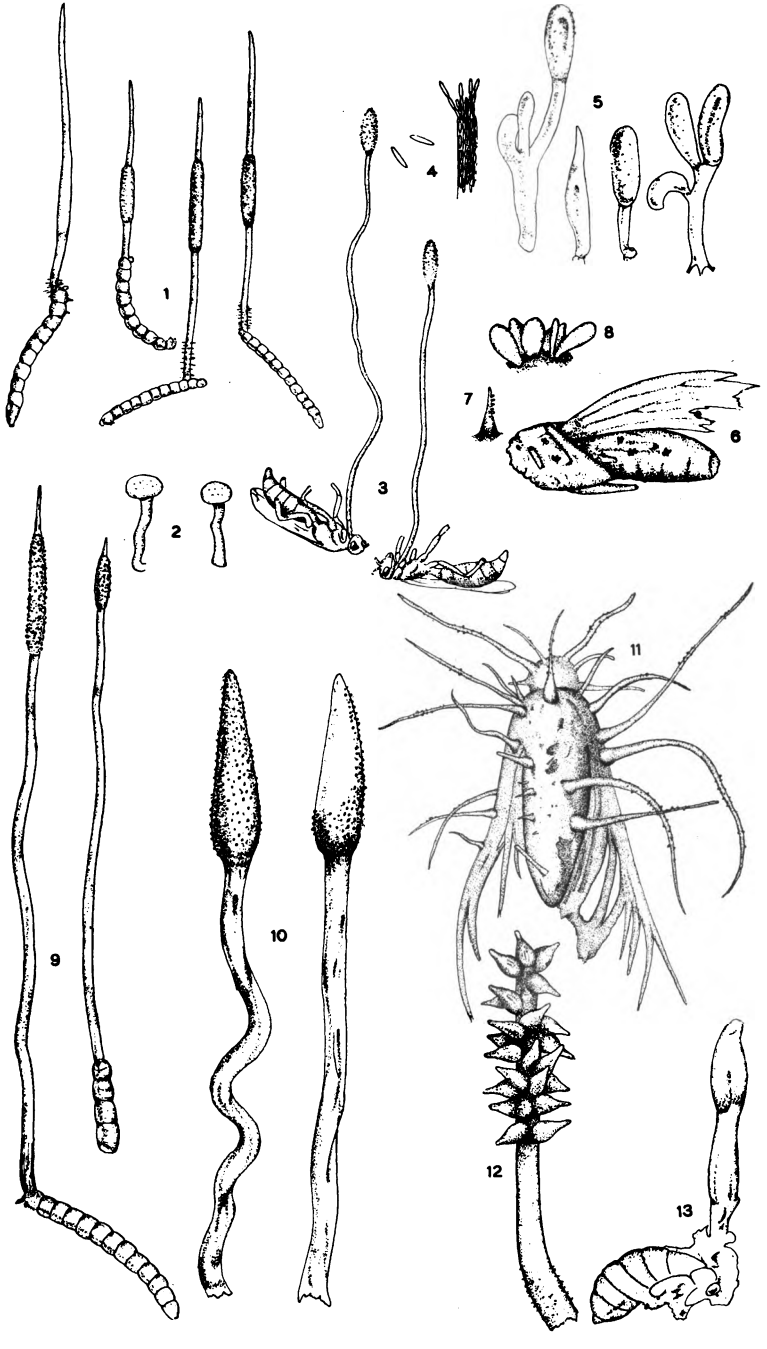
Fig. 6. *Cordyceps herculea* (Schw.) Sacc. Copied from photograph in herbarium of the New York Botanical Garden, about natural size.

Fig. 7. *Cordyceps entomorrhiza* (Dicks.) Link. Copied from the original drawing.

Figs. 8–9. *Cordyceps agariciformia* (Bolton) Seaver.



CORDYCEPS



CORDYCEPS

Fig. 8. Two plants copied from the original drawing.
Fig. 9. Portion of ascus and spore segments.
Figs. 10–11. *Cordyceps militaris* (L.) Link.
Fig. 10. Two plants on cocoon, about natural size.
Fig. 11. Ascus and spores.
Figs. 12–13. *Cordyceps parasitica* (Willd.) Seaver. Copied from original drawing, about natural size.

EXPLANATION OF PLATE 54

Fig. 1. *Cordyceps stylophora* Berk. & Br. Copied from original drawing.
Fig. 2. *Cordyceps armeniaca* Berk. & Curt. Copied from original drawing.
Figs. 3–4. *Cordyceps sphecocephala* (Klotzsch) Massee.
Fig. 3. Two plants copied from Tulasne.
Fig. 4. Portion of ascus with spores.
Fig. 5. *Cordyceps palustris* Berk. & Br. Copied from original drawing.
Figs. 6–8. *Cordyceps Cockerellii* (Ellis & Everh.) Ellis. Drawn from original material.
Fig. 6. Remains of insect showing clusters of perithecia.
Fig. 7. Portion of erect stroma with perithecial clusters.
Fig. 8. Cluster of perithecia.
Fig. 9. *Cordyceps acicularis* Rav. Copied from original drawing.
Fig. 10. *Cordyceps Ravenelii* Berk. & Curt. Copied from original drawing.
Fig. 11. *Cordyceps Sphingum* (Schw.) Berk. Copied from Tulasne.
Fig. 12. *Cordyceps isarioides* M. A. Curtis. Copied from Massee.
Fig. 13. *Cordyceps sobolifera* (Hill.) Sacc. Copied from Tulasne.

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